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PERMANENT ADDRESS:

4815 37th St.

Lloydminster, Saskatchewan

.....

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THE UNIVERSITY OF ALBERTA

A STUDY OF PHARMACY AND DRUG INFORMATION SERVICE REQUIREMENTS

by

© FREDERICK CARL RUMPEL

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

OF MASTER OF HOSPITAL PHARMACY

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FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled "A Study of Pharmacy and Drug Information Service Requirements" submitted by Frederick Carl Rumpel in partial fulfilment of the requirements for the degree of Master of Hospital Pharmacy.

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Supervisor

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Date April 27/74

ABSTRACT

In studying pharmacy and drug information service requirements, it was learned that involvement of a pharmacist in a patient care area had no effect on the trends in supplying drug information.

Attempts at evaluating the quality of information supplied, by having a pharmacist in the area, failed. However, the subjective feelings of physicians, nurses and pharmacists, involved in the study, indicated that it was advantageous and beneficial to have a pharmacist in the patient care area.

Nurses, as a single group, required drug information most frequently. To provide more nursing-oriented information, it was felt to be advantageous for a pharmacist to be in the patient care area to obtain first-hand knowledge of nursing problems and nursing involvement.

The telephone proved to be utilized in a great majority of cases for requesting information affirming the need for the establishment of a telephone line solely for this service.

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CHAPTER I

GENERAL INFORMATION

A. Introduction to the Thesis Project

Drug information has always been an integral part of the pharmacist's role (Tetrault, 1972). The literature suggests that the pharmacist, in his daily routine, is constantly exchanging his role as a pharmacy practitioner for that of an advisor, consultant, informer or informant, educator and student (Prodie and Meyer, 1961; Ferguson, 1965; and Parrott, 1962). One concludes that yesterday's knowledge no longer serves the pharmacist, as an effective member of tomorrow's health care team, in providing the best patient care possible. A vast amount of drug information has been published to date which further complicates the composite role of the modern pharmacist. It has been rationalized that drug information must be consolidated and evaluated in a rational manner by the pharmacist so that it can be disseminated and utilized effectively in improving patient care (Kelsey, 1965). Thus, if today's pharmacist wants to keep pace with the demands of his profession, he must accept the challenge of continuous study, development and refinement of his skills in the consolidation, evaluation and communication of drug information.

Physicians and nurses, the primary users of drug information, practise in hospitals. This is where the drug information needs arise and is where drug information should be located (Francis, 1965). Justification for the service is based on its role in improving patient care through critical attention to all aspects of hospital treatment. Pellegrino (1965a) states emphatically that the service should not be used as a means to attain greater economy and efficiency, nor to regiment the medical staff.

Hospitals in Alberta are not required by law to provide a

drug information service. Section 33 (1) of the Alberta Hospitals Act states that "each hospital shall strive to meet the standards of accreditation of hospitals established by the Canadian Council on Hospital Accreditation". In 1967, the Revised Canadian Council on Hospital Accreditation - Pharmacy Service Guidelines recommended in Section 1 (h) that "in addition to his traditional role in drug manufacturing and dispensing, the hospital pharmacist has a collaborative role to play with the medical staff in a number of ways including the provision of drug information services, facilitating the reporting of adverse drug reactions, and reviewing prescriptions for the prevention of drug incompatibilities".

Drug Information Service (Development)

Past President Hubert Humphrey (1965), speaking as Chairman of the Senate Subcommittee on Reorganization and International Organizations, stated that "keeping up with the literature is a universal problem in the pharmaceutical, as in other, sciences". That same year saw the establishment of the first information centre at the University of Kentucky Medical Centre under the leadership of D.F. Burkholder. As pointed out by Parker (1965), the proposal for such a service arose from an expressed demand by the Department of Medicine for an outstanding program of rational drug therapy[1] at the Medical Centre.

[1] Rational drug therapy is the use of medicinal agents of demonstrable efficacy based on experimental and clinical data (published or from the clinician's own experience). The clinician must proceed prudently in the absence of scientifically verifiable information, and deviations from standard practices should be pursued only when the patient's situation requires it, while observing carefully the effect of the procedure. Too often drug therapy is regarded as rational if it seems reasonable and seems to benefit the patient regardless of whether there is any scientific evidence to support that conclusion. What is considered "evidence" may simply be that the patient got better and, of course, that increases one's confidence in what seems reasonable.

When the proposal for the Centre was submitted in June, 1960, the justification for the service was based on its potential value in achieving an institution-wide drug therapy program (Burkholder, 1965; Parker, 1965; Pellegrino, 1965a). It was expected that the information service would require prime hospital space for easy access, would cost a great deal of money to establish and maintain, and would require as long as three years before benefits of the service might be realized. The proposal also stated that as long as five years might be required for evaluation of the service.

In the interim between the acceptance of the proposal and inauguration of the Centre, much planning and discussion took place. It was suggested that D.F. Burkholder might be the appropriate person to direct the service. Dr. Burkholder's excellent academic background, unusual dedication to advancing the cause of rational drug therapy, and willingness to work were cited as attributes that would help the Centre succeed (Parker, 1965; Pellegrino, 1965b). The continued successful operation of such an information service must, however, rely on the constant support of key people in both administrative and clinical departments (Burkholder, 1965; Francke, 1965). To ensure the involvement of Medicine and Pharmacy, these two departments were integrated under the dual appointment of Dr. Burkholder as a non-teaching research assistant with the Department of Medicine and Assistant Director of the Pharmacy Department.

It was not the intention of the Centre to build up vast amounts of information prior to receiving questions. Rather, there was an attempt to accumulate information which could be used in emergency situations concerning toxicity, adverse actions, overdosage and its

treatment, and all data helpful in identifying medications. For this, a permanent file was established, up-dated, and maintained with pertinent references (Burkholder, 1965; Parker, 1965).

At its inauguration, the Centre was supplying three categories of information (Burkholder, 1965):

1. Information to the medical and dental staffs concerning clinical or research problems. This was the most time-consuming task of the Centre. Queries usually arose from a patient management problem and Burkholder (1965) stressed the importance of delving beneath the surface of the question to obtain all relevant facts so that the information to be provided could be specific and more helpful.

2. Information to the Pharmacy and Therapeutics Committee. This back-up information was necessary to keep the Formulary System up-dated and operational. The Pharmacy and Therapeutics Committee, as a standing committee of the medical staff, advised the hospital pharmacy, the administration, and the medical staff on matters pertaining to the procurement, storage, selection, evaluation and use of therapeutic agents (Derewicz, 1968a, 1968b, 1968c, 1969; Pellegrino, 1965b). Thus the Formulary system, conscientiously and critically constructed, became a guide to those drugs of established therapeutic value with respect to current medical knowledge. It represented the considered opinion of the medical staff based on the best available information in keeping with the needs of the particular hospital (Pellegrino, 1965b). The duty of the Centre became one of providing the Pharmacy and Therapeutics Committee with the best available information that had been published at the local, national, and universal levels. This information, distributed prior to Committee meetings, allowed the members to be

knowledgeable at the time of assembly. The Director of the information service, a non-voting member of the Committee, made reports on local drug utilization of both formulary and non-formulary drugs including investigational drugs.

3. Information which involved a correlation of drug utilization with diagnostic and laboratory tests. By placing patient data on IBM cards to hasten analysis, it was projected that the resulting data would facilitate the task of evaluating formulary and non-formulary drugs. This consequent information would be of value in the addition to or deletion of drugs from the Formulary system. Another projected use for such information would be the comparison of local and national incidence of adverse drug actions as well as drug usage patterns.

The proposed future of the drug information service included plans for an Adverse Reaction Reporting System in conjunction with the Food and Drug Administration of the United States. A program for Drug Information Traineeship was to be established in affiliation with the American Society of Hospital Pharmacists and the Faculty of Pharmacy at the University of Kentucky. As well, it was suggested that it would be advantageous to house the headquarters for the Kentucky Poison Control program in the Drug Information Centre.

Drug information services established subsequently to the above described Centre were planned along one or more of the strategies of the Kentucky group. Persons initiating these new services had the view of starting with a small, simple system and developing into a more sophisticated system with time and experience (Bell, Grimes, Bouchard and Gonzales Duffy, 1970; Hutchinson and Burkholder, 1970; Ligouri, 1968; Mary, 1965; Tester and Oleson, 1971).

B. Points of View of Drug Information Services

1. Viewpoint of Administration

The "raison d'etre" of hospitals is the patient (Perrow, 1963; Mary, 1965; Dinel, 1969). The "Board of Governors" or "Board of Directors" of a hospital is legally responsible for the quality of any service provided in the hospital for the patient. As the official representative of the Board of Directors in its absence from the hospital, the "Executive Director" or "Administrator" insures that the goals of the hospital are accomplished through the utilization of contributions and efforts that diverse groups of people, including committees, make to the hospital. The legal implications of hospital goals are resultant from individual provincial or state Hospital Acts. Collectively these "Acts" have not taken a definite stand with respect to statements about rational drug therapy programs in hospitals. Reference has been made in these "Acts" to hospital and medical staff by-laws and Pharmacy and Therapeutic Committees. In particular, Section 15 (a) of the Alberta Hospitals Act makes specific reference to hospital by-laws for the establishment of "routine stop orders on antibiotics, narcotics, anticoagulants, sedatives and other potentially dangerous drugs".

In both Canada and the United States, the concept of rational drug therapy started under the guise of statements for the minimum standards acceptable for the practice of pharmacy in hospitals. With time, reference was made to the economic aspects of drug therapy in hospitals, the expansion of the role of pharmacists in hospitals, and the nebulous term "quality of patient care" (Irons, 1930; Wittrup, 1965). It was not until 1959-60 in the United States and 1969 in Canada that

official statements on Pharmacy and Therapeutics Committees and Formulary systems were proposed and accepted by the National Pharmaceutical and Hospital Associations in both nations. Hospitals had thus accepted the responsibility of promoting rational drug use (Wittrup, 1965). In the majority of hospitals, this responsibility was delegated to the Pharmacy and Therapeutics Committees. In certain hospitals Drug Utilization and other Committees were established for this purpose.

In any case, the delegated responsibility implied the establishment of a Formulary system. It also became the responsibility of such a Committee to continually evaluate drugs in the Formulary system, as well as non-formulary ones. Such evaluation provided a continuously up-dated Formulary that reflected the current thoughts of the medical staff of each hospital about the rational use of drugs.

Administrators agreed that, as presently organized, Pharmacy and Therapeutics Committees were not capable of carrying out such evaluation, and therefore implemented and/or recommended the establishment of drug information services (Mary, 1965; Wittrup, 1965). To insure the most effective involvement of such a service in the overall goals of a hospital, the administration was required to provide organizational guidance and recognize the initiative of the service with respect to patient care (Mary, 1965).

2. Viewpoint of Physicians

Section 12 of the Alberta Hospitals Act places the ultimate responsibility for the patient in the physician's jurisdiction. This responsibility is complicated by two factors:

(i) An increasing percentage of the population with ready

access to the medical profession. The practising physician must receive and accept the challenge of every patient he sees or the patient will see another physician (Keefer, 1966; Polack, 1973).

(ii) Pharmaceutical manufacturers motivated to do applied research because of the financial reward. Such research is producing a vast amount of drugs which are revolutionizing therapeutics. There is a feeling that these new drugs are produced without adequate clinical evaluation due to a lack of availability of patients (Lewis, 1968). The physician has access to the patients but lacks the time, training and rigorous self-discipline required for the control of clinical investigations (Lewis, 1968). Accompanying this torrent of new drugs, including different dosage forms of old drugs and combinations of existing drugs, is a vast amount of drug information.

As part of the responsibility for the patient, the physician must conscientiously select a drug that will best satisfy the needs of the patient. To make this decision, the physician must be selective, discriminating and utilize critical judgment in assessing the drug information and observing the patient. If the physician does not have the time to adequately evaluate the information, it may result in one of two alternatives (Pellegrino, 1965b):

(i) Plunge in and try the drug. This may result in hurried observation of a few cases.

(ii) Wait until the drug has established itself. This may deprive the patient of the benefits of an effective drug.

The literature notes that drugs were prescribed on the basis of results of empirical observations without insight into the mode of action of drugs at the cellular, enzymatic or molecular level (Lewis, 1968).

Because physicians rely on their own experiences when prescribing, they need to learn more about the action of drugs in patients (Keefer, 1966). In conjunction with this, physicians must make observations, record their observations, and then compare them with the results of others. In this way decisions can be made about their "therapeutic masterpieces". None-the-less, it seems virtually impossible for the physician to make rational judgments about the deluge of new drugs (Pellegrino, 1965a).

Three institutional means to help the physician in prescribing from the cornucopia of present-day pharmaceuticals are the Pharmacy and Therapeutics Committee, the Formulary system, and the drug information service. These are indispensable means of attaining scientific therapeutics (Pellegrino, 1965a).

Physicians do not unanimously agree to the involvement of pharmacists in aiding in decision making about drugs or drug therapy. Wilbur (1968) claimed that by encouraging such involvement, pharmacists may want to be physicians rather than pharmacists. Other physicians have found the involvement of pharmacists beneficial because of their contributions in drug information, drug monitoring, drug admission interviews, discharge consultations, drug research and in teaching of the pharmacological, pharmaceutical and therapeutic properties of drugs. (Irons, 1930; Goddard, 1968; Lewis, 1968; Platt, 1967). Wise (1973) went as far as to state that "all health workers must cooperate in bringing the pharmacist into the team and that in order to do sc effectively, members must submerge their own individual interests in favor of common goals directed to more comprehensive patient care".

One important aspect of pharmacist involvement with respect to drug therapy was that of the local dissemination of drug information

in the community and university hospitals (Pellegrino, 1965b). By having a national collection centre for the consolidation of large amounts of information, feedback of this composite information to the local centre would have greater impact on the therapeutic activities of the country's physicians and aid in attaining the goal of nation-wide rational therapeutics (Pellegrino, 1965b).

Pharmacists are aware of the use, misuse and abuse of drugs by the public. Because people have the right to know about drugs and their effects, pharmacists should provide them with information that meets their needs. This contributes to clarifying the mystique of drug research, reinforcing drug safety and enlightening the public with respect to drug effectiveness (Keefer, 1966).

For successful operation of a drug information service, it was important to "zero in on" the information needs of the physician. Once the physician's needs were established, the drug information needs of the other health team members could be fulfilled with the aid of the physician. If the physician's needs were not met, then it mattered little about the needs of the other health team members as the patient would not receive the proper therapy (Weston, 1967).

3. Viewpoint of Nursing

Nurses have found and are continuing to find that their professional role involves a steadily increasing amount of responsibility with respect to rational drug therapy. Nursing educators (Baumgart, 1971; Stoddern, 1968; Farrah, 1967) have recognized that new graduates do not have sufficient background knowledge in pharmacology to either meet physician demands or even to insure complete patient safety. Today nurses are expected to be knowledgeable of drug dosage forms, their

routes of administration, and their desirable and undesirable effects. On some occasions, nurses are given the responsiblity for deciding when a particular drug should be administered (example, orders on a p.r.n. or s.o.s. basis). Furthermore, nurses are expected to be able to correlate nursing care with drug therapy (providing a therapeutic environment) and for this reason adequate clinically oriented drug information is required by the nurse (Farrah, 1967; Freeman, 1973).

To be more specific, nurses must know what a drug is, why a particular drug is ordered for a patient, its mode of action, the physiology involved, the symptoms of toxic doses, as well as drug reactions. Every graduate nurse is professionally, ethically, and legally bound to acquire and maintain a sufficient amount of such knowledge in order to practise safely and effectively (Farrah, 1967).

A drug information service can aid in solving these shortcomings by providing improved patient protection through strength of knowledge (Stoddern, 1968; Levine, 1970). By providing an orientation toward drug therapy, nurses will be encouraged to better understand and be in a position to rationally appraise drug therapy. Guidelines for drug information beneficial to nurses were stated as follows (Levine, 1970):

(i) A forthright separation of technical from professional aspects of medication therapy;

(ii) The use of resource materials which are nursing oriented and, simultaneously, the removal of materials which are essentially drug advertisements dedicated to exhortation rather than scientific drug information;

(iii) The selection of content for a drug information

program by a professional team, the physician, the nurse, and the pharmacist, who also participate in the program and who recognize its educational goals;

(iv) On-going sources of information dedicated to the dissemination of facts regarding the social, economic, legal and political issues that influence drug usage.

Nurses have suggested other dimensions of involvement of pharmacists such as in preparation and distribution of a nursing bulletin, conducting drug histories, identification of medications, and discharge consultations.

Nurses do feel a drug information service is essential to improve patient care. To ensure a viable system, the service must be based on continuing participation and dialogue between the physician, nurse, and pharmacist encompassing team experience and current medical knowledge.

4. Viewpoint of Pharmacists

The concept of a hospital-based drug information service has shown impressive development in Europe and North America (Burkholder, 1963; Burkholder, 1965; Anderson and Latiolais, 1965; Rosenberg, 1968; Nordahl, 1972; Reimers, 1972; Groth, 1972; Longshaw, 1972). It has become an accepted fact that drug information is an integral part of the broadening contribution of the pharmacy service in a hospital (Zilz, 1967; Rosenberg, 1968; Durant and Zilz, 1967; O'Byrne, 1972; Naylor, 1972; McLean, 1972; Taylor, 1972), and therefore if the service is to be truly effective, it must be able to deliver meaningful information at the point of use (Bell, Grimes, Bouchard and Gonzales Duffy, 1970).

Problems complicating the delivery of meaningful information include the utilization of numerous therapeutic agents and the accompanying literature extolling these therapeutic masterpieces. From the volume of "drug literature" published each year, one readily concludes that no one single source of information is all-embracing in the needs it must serve. Thus, there is no singular solution to evaluation of the drug literature and, as the experience of the 1960's indicates, each drug information service must be established to suit the particular needs of the individual hospital or hospitals (Burkholder, 1963; Bell, Grimes, Bouchard, and Gonzales Duffy, 1970; Rosenberg and Peritore, 1971; Longshaw, 1972; Benson and Kabat, 1967). Regional drug information networks have been established consisting of a main hospital-based centre, subcentres and affiliates to service the immediate and surrounding communities (Pearson, Salter, Bohl, Thudium and Philips, 1970; Pearson, Thudium and Philips, 1971; Zilz, 1967; Groth, 1972). Network information services have bridged the gap between health professionals and the cornucopia of drug literature in a manner similar to the autonomous local service in an individual hospital. This has been accomplished by operating the network as a rapid, random access service function supplying total information about drugs.

One of the major concerns pharmacists have expressed with respect to this service is the initial receipt of request for information (Burkholder, 1963; Burkholder, 1965; Francke, 1965; Tetrault, 1972). The important point here is exposing the patient-management problem prompting the request. To aid pharmacists in developing an expertise in this area, job aids, question check lists, and question documentation sheets have been developed (Pearson and Salter, 1969; McLean, 1972;

Naylor, 1972; O'Byrne, 1972; Taylor, 1972). Once the question has been received, the pharmacist undertakes the task of searching for adequate information and communicating this to the information user. Devices utilized by pharmacists for rapid retrieval of information are:

(i) categories of reference material

(ii) filing systems for storage and rapid retrieval of drug information

(iii) commercially available drug information systems

It is important at this point to expand on these devices. Drug Information Centres may have a minimal or extensive collection of textbooks, journals and other reference sources. By categorizing these reference sources under the headings of dosage, therapeutic use, side effects, etc., one can easily locate such information.

Burkholder's (1963) original thesis was not to stockpile information in a Drug Information Centre. If stockpiling of information is carried out, it necessarily indicates the task of routine evaluation of current drug literature and up-dating the pool of information already in the Centre. Filing systems, which have been of concern to pharmacists, have been developed to meet individual needs (Heller, 1961; Stauffer, 1959; King and Flack, 1961; Jeffrey, 1961; Chan, 1970). As noted by Tuttle and Stewart (1970), "the compatibility of information is only as valuable as the degree of accuracy of the data compiled therein". Some areas where files of information have proven effective are in Poison Control Information, drug interactions, intravenous admixture incompatibilities, and investigational drug information (Burkholder, 1963; Napke, 1970; Hansten, 1970; Francke, 1962; Francke, 1963).

The commercially available drug information systems are

primarily abstracting and cross-indexing services for numerous publications on drug information and related topics. Included in these systems are the de Haen Card System (seven systems in all); Excerpta Medica, a European-based system; the Iowa Drug Information Service, a computer-based service with information on microfilm; Medlars and Index Medicus. All of these systems are expensive to obtain and maintain. And, if such systems are supported through tax dollars or grants, there is always the possibility that such funds may be discontinued. Once discontinued, the existing cards soon become out-dated and are no longer useful to the pharmacist (Weston, 1967; McLean, 1972; Taylor, 1972).

Drug information has been classified with regard to its relationship to pharmaceutics and/or therapeutics (Benson and Kabat, 1967). Tetrault (1972) mentions a three category classification for drug information based on the time required to locate and obtain the information. However, drug information as a product, has no usefulness until it is communicated to those who have need of it (Hutchinson and Burkholder, 1971). It is important that pharmacists understand the information they find and communicate it to the "user" in a clear, concise manner (Weston, 1967; Smith, 1970; Schroeder, 1971; Pearson and Salter, 1969). Because of involvement in the patient care areas, pharmacists have developed more concise, patient-specific attitudes relative to the needs and use of drug information for the nurse, physician, and the patient (Hutchinson and Burkholder, 1971; Bell, Grimes, Bouchard and Gonzales Duffy, 1970).

Through drug information services and in conjunction with Pharmacy and Therapeutics Committees, pharmacists have contributed to the establishment and maintenance of formulary systems that do reflect

the current medical opinion of the rational use of drugs. The area of clinical pharmacy has grown out of the knowledge and expertise of drug information pharmacists. As Hutchinson and Burkholder (1971) state, "it requires both a centralized Drug Information Centre and a decentralized Clinical Service to provide a profound drug program within the hospital".

Patient-specific attitudes have aided the pharmacists in conducting patient drug histories and discharge interviews. Drug information services have been able to establish drug utilization patterns which may or may not result in the pharmacist's involvement in research at the institution level. Certainly, instructing student pharmacists in drug information has become an important task of the drug information pharmacist (Schroeder, 1971). Instructing nursing students about drugs and drug therapy is an equally important task. Another area of involvement has been and will continue to be in Continuing Education programs for both community and hospital pharmacists.

Drug information pharmacists, as members of the health care team, have contributed and will continue to contribute to improved patient care in the hospital.

5. Viewpoint of Pharmacy Educators

Educators, as well as pharmacists, have wondered what is to become of the practice of Pharmacy. To survive as a profession, pharmacy must have a sound, scientific educational base. In the last decade, educators and practitioners have expressed concern with respect to the components of the practice; that is, how they are planned, ratified, and implemented. Two components that have received a great deal of

thought and discussion are the clinical and drug information elements of pharmacy practice. Assuming the thesis that it is the function of pharmacy educators to develop new aspects of the profession, in particular clinical and drug information factors, there are several problems that must be confronted (Brodie and Meyers, 1961):

(i) Providing students with adequate knowledge. It is necessary to ensure that students of pharmacy, on leaving college, fill the roles of a changing profession. These roles will revolve around clinical pharmacy and drug information services in both community and hospital practice.

(ii) Motivating practising pharmacists to accept the challenge of these new aspects of pharmacy. These pharmacists cannot be forced to return to college. On an individual basis, some pharmacists have kept pace with the advances of their profession, while others have not. In order to establish a base-line for all post-college education, Colleges of Pharmacy and provinical or state Pharmaceutical Associations are promoting Continuing Education programs for pharmacists.

(iii) Scarcity of source materials to develop sound instructional procedures in the area of drug information and clinical pharmacy for college students and pharmacists. In altering the composition of curricula, pharmacy educators have been asking whether pharmacists have become involved in such roles; are physicians and other para-medicals accepting and utilizing pharmacists in these roles; are pharmacists in these capacities meeting the needs of physicians and other para-medical groups; to what extent is the pharmacist's knowledge utilized now; and what is the projected future utilization of this knowledge and involvement of the pharmacist?

As a result of educators answering their own questions, numerous changes in curricula and/or course content have been made. The academic training for a Bachelor's degree in pharmacy has been expanded in numerous colleges in the belief that the profession could survive on nothing less (Rising, 1962). Educators have revamped their curricula to include compulsory courses in therapeutics, an increased emphasis on biological sciences with exposure to anatomy and pathology, clinical pharmacy experience, and drug information experience (Schroeder, 1971; Canada, 1973). All of these changes have confirmed and fulfilled the need for a firm scientific background in pharmacy. They do not, however, strengthen the already existing shortcomings of the profession. To bolster these weak points, pharmacists must be motivated to be drug consultants, to understand physician and para-medical needs, to utilize pharmaceutical knowledge in patient care areas, and to discern when and where to direct physicians and para-medical groups to experts in pharmaceutical and other fields if indicated (Francke, 1962).

Documentation validating the importance of clinical pharmacy and drug information is very thin (Rising, 1962). This makes it difficult to formulate accurate statements concerning the present status of these new features of the practice. If these components are desirable functions of pharmacy, practitioners and educators must determine joint study methods in order to document their importance. Francke (1973) indicated that in so doing, it is important to remember service to the patient and not service solely to the student. Thus, today it is important that instructors in pharmacy be involved in the active practice of clinical pharmacy and drug information. Pharmacy has its own body of knowledge which it utilizes and makes available, at appropriate times,

to all members of the health care team and the public (Parrott, 1962). With pharmacists utilizing this knowledge in active practice, they can better serve as models for pharmacy students.

C. Studies Conducted Involving Drug Information

The literature contains numerous studies that have been conducted in an attempt to validate and give direction to drug information services. Research teams employed variations of the interview/questionnaire technique in situations ranging from a telephone interview by one physician of fifty-seven pharmacies in a test area to an interview situation with housewives in another test area. Questionnaires were utilized by Brodeur and Lamy (1967) to determine the drug information and other pharmacy services required by numerous departments in six hospitals in a test area. A combination of these techniques was employed by Benson and Kabat (1967) to ascertain the types of drug information required by physicians and nurses in the establishment of a drug information centre that would meet these needs at its inception. Piercoro (1966) and Rising (1962) had pharmacists record questions that came into their pharmacies. These studies were attempts at determining and clarifying the status of pharmacists as drug consultants. Fassold and Gowdey (1968) mailed questionnaires to 531 physicians in Southern Ontario to ascertain physician reaction to present methods of drug promotion and drug information distribution. Drug information services have been established, and their establishment publicized in bulletins distributed from the Pharmacy Department (Rosenberg and Peritore, 1971; Bell, Grimes, Bouchard and Gonzales Duffy, 1970; Smith, 1967).

Bell, Grimes, Bouchard and Gonzales Duffy (1970) reported that

advertising the facility was not sufficient. In an attempt to provide a positive approach to supplying drug information, a physician's permission was obtained for pharmacists to follow his practice and monitor the drug therapy of his patients. The mode of communication concerning drug therapy between physician and pharmacist was a sheet of paper placed on the patient's chart. A longitudinal line divided the page in half - one side for the physician, the other for the pharmacist. This basic design proved satisfactory and, as a result, a pharmacy consultant program was inaugurated.

The results of the above studies indicated many shortcomings in the practice of pharmacy. Physicians were not impressed with existing methods of distribution of drug information. They relied primarily on their own experiences with drugs, secondly on the experiences of their colleagues and to some extent on personal contact with detailmen and preferably pharmacists (Fassold and Gowdey, 1968; Pising, 1962). There was an indication that pharmacists provided physicians and the public with little information (Rising, 1962; Knapp, Knapp and Engel, 1966) while Miller (1961) indicated in his study that pharmacists had difficulty communicating in professional terms. Other results from Miller's study (1961) indicated that pharmacists' sources of information were questionable and that hospital pharmacists displayed more ability in the role of a consultant than did pharmacists in traditional or dispensing pharmacies. Brodeur and Lamy's study (1967) indicated that once an efficient dispensing service had been established, pharmacy could broaden its services to meet the multitude of needs required by other members of the health care team and the general public, drug information not being the least among them. However, Piercoro (1966)

suggests that answering requests for drug information cannot, at present, be viewed as a major role of the typical pharmacist.

Even though the concept of drug information is not new, there are still answers to the problems of implementation and evaluation of this service to be resolved. The literature indicates that it is still an educational experience for pharmacists to utilize their knowledge in the patient care areas, gain insight into rational therapeutics, and take their place on the health care team to obtain first hand experience in the utilization of drugs on patients. Bearing this in mind, a study was carried out to evaluate presently existing drug information services in view of pharmacist exposure in the patient care area as the altered variable.

CHAPTER II

METHODS AND MATERIALS

CHAPTER II. METHODS AND MATERIALS

The research project was designed utilizing a pretest-posttest experimental situation. This design was chosen because of the nature of the interaction; an answer was to be given as the result of a question being asked (Flathman, 1973; Franklin and Osborne, 1971).

A. The Pretest Study

During the pretest study, the existing drug information services in four acute care hospitals in Edmonton, Alberta were to be evaluated. To facilitate this task, drug information documentation sheets were designed (see Appendix I). When a pharmacist was asked a question requiring drug information or asked specifically for drug information, a drug documentation sheet was to be filled out by that pharmacist. The documentation sheets were to be collected every two weeks over a four and one-half month period; the time period arbitrarily chosen for both the pre- and posttest observations. To determine the quality or sufficiency of the information provided, a second sheet (Appendix II) in the form of a letter, was supplied.

The pharmacy departments were informed that the staff of the Clinical Pharmacy Education Department would continue to act as a back-up source for information during both the pre- and posttest periods.

B. The Posttest Study

Prior to the posttest study, a list of reference materials, including textbooks, journals and other publications was established (Appendix III). A simple filing system, based on the American Hospital Formulary Service, was established for the purpose of filing information which might be required frequently.

One hospital was selected as the site for the establishment of a pharmacist in charge of drug information and this hospital became designated as the "test hospital". The pharmacist in charge of drug information was a graduate student from the Faculty of Pharmacy and Pharmaceutical Sciences, University of Alberta, Edmonton, Alberta.

The duties of this pharmacist, in a teaching medical patient care area, were to attend nursing cardex rounds at 0800 hours, physicians' rounds from 0900 to 1030 hours and nursing-patient conferences from 1045 to 1120 hours. This routine was carried out Monday, Tuesday, Thursday and Friday of each week for the four and one-half month post-test period. A tour of duty was established in the pharmacy office from 1230 hours until 1530 hours to enable the pharmacist to become involved in drug information queries from other areas of the "test hospital". There were no scheduled physicians' rounds on Wednesdays and this was established as a library day for the pharmacist. By being in a patient care area, it was anticipated that the pharmacist would become involved in discussions about drugs with nurses and physicians. Thus, the criteria for filling out a drug information documentation sheet was the pharmacist being asked a question about drugs or specific requests for drug information by nurses and physicians.

Throughout the posttest period the pharmacist reviewed the medical and pharmaceutical literature, obtained background knowledge of disease states, drug therapy, drug-drug and drug-laboratory test interactions.

The posttest study was conducted in five acute care hospitals in Edmonton, Alberta. Criteria for filling out a drug documentation sheet was, again, the asking of a question involving drug information or

specific information about drugs. The drug information documentation sheet (Appendix I) used in the pretest period was again utilized in the posttest period. The documentation sheets were collected and reviewed on a two-week basis over the four and one-half month posttest period.

C. Analysis of Data

The pretest and posttest drug information documentation sheets for each hospital were coded into a number composed of six parts. The time involved in answering the question or query was coded into hours, minutes and seconds. The six part number (Appendix IV) was composed of the Request (17 categories), Subsequent Questions (1 = yes, 0 = no), References (8 categories), Source of Request (9 categories), Communication Mode (4 categories). Coded data was fed into a P D P 11/05 Computer which was connected to a Dicom 344 Cassette Mag-Tape system and the data was stored on a magnetic cassette tape. This tape became the data bank and was composed of eight files. File 1, 3 and 5 were pretest data from three acute care hospitals in the Edmonton test area. Files 2, 4 and 6 were composed of the posttest data from the above three hospitals. File 7 contained the pre- and posttest data from an acute care hospital involved in the study and file 8 contained the data from an acute care hospital involved in the posttest study only. Computer programs to analyse the data (Appendices V, VI, VII and VIII) were written in a modified Focal 11 computer language to gain access to the Dicom 344 Cassette Mag-Tape system and an NS 636 Multi-Channel Analyser through the P D P 11/05 computer. The programs and analysed results were printed out on an ASR 33 teletype machine. The statistical test applied to the analysed results to determine statistical significance was the "significance of the difference between two independent

proportions" (Ferguson, 1971).

CHAPTER III

RESULTS

CHAPTER III. RESULTS

Analysis of the data revealed blanks in various file categories. Thus, to ensure more meaningful results, the data was grouped into the headings, "Doctor", made up of physician, intern or resident, and medical student; "Nurse", composed of nurse and special nurse; and "Pharmacist", consisting of community pharmacist, hospital pharmacist, and clinical pharmacist. The group designated as "Other" was omitted from the analysis of the data in Program 1 (Appendix V) due to the small number of questions asked by this group. By grouping the data, many of the blanks in the file categories disappeared, giving a comprehensive view of the drug information requests in the Edmonton test area.

Four computer programs were utilized in analyzing the data. Program 1 (Appendix V) gave the total number of requests per file, the total time spent answering the requests, and the average time taken to answer each request. This program further divided the data in each file into percentage distribution of requests (17 categories in all) with the type of user, the frequency that subsequent questions were asked by pharmacists for each category of question and each class of information user. Lastly, this program instructed the computer to print out a table of the average time spent in answering each category of request by each of the classes of information user.

Program 2 (Appendix VI) provided the computer print-out of the total number of questions for all files, as well as a table of the percentage distribution of requests according to the type of user. The print-out also contained the average per cent of questions asked by each class of user over all eight files in the data bank.

Program 3 (Appendix VII) instructed the computer to print out

the percentage frequency that references were used in each file to answer each category of question. The print-out also contained the average (in per cent form) amount of time references were used in answering all questions in each file, as well as the percentage of references used over all files in answering each category of request.

Program 4 (Appendix VIII) showed the modes of communication that were used by the various classes of information user in obtaining drug information. The second table indicated the amount of time spent by pharmacists in answering requests for the various classes of information user with respect to the mode of communication utilized. In addition, the tables in Program 4 gave the overall percentage distribution and the average time spent in answering requests for the four modes of communication.

A. Program 1 (Appendix V)

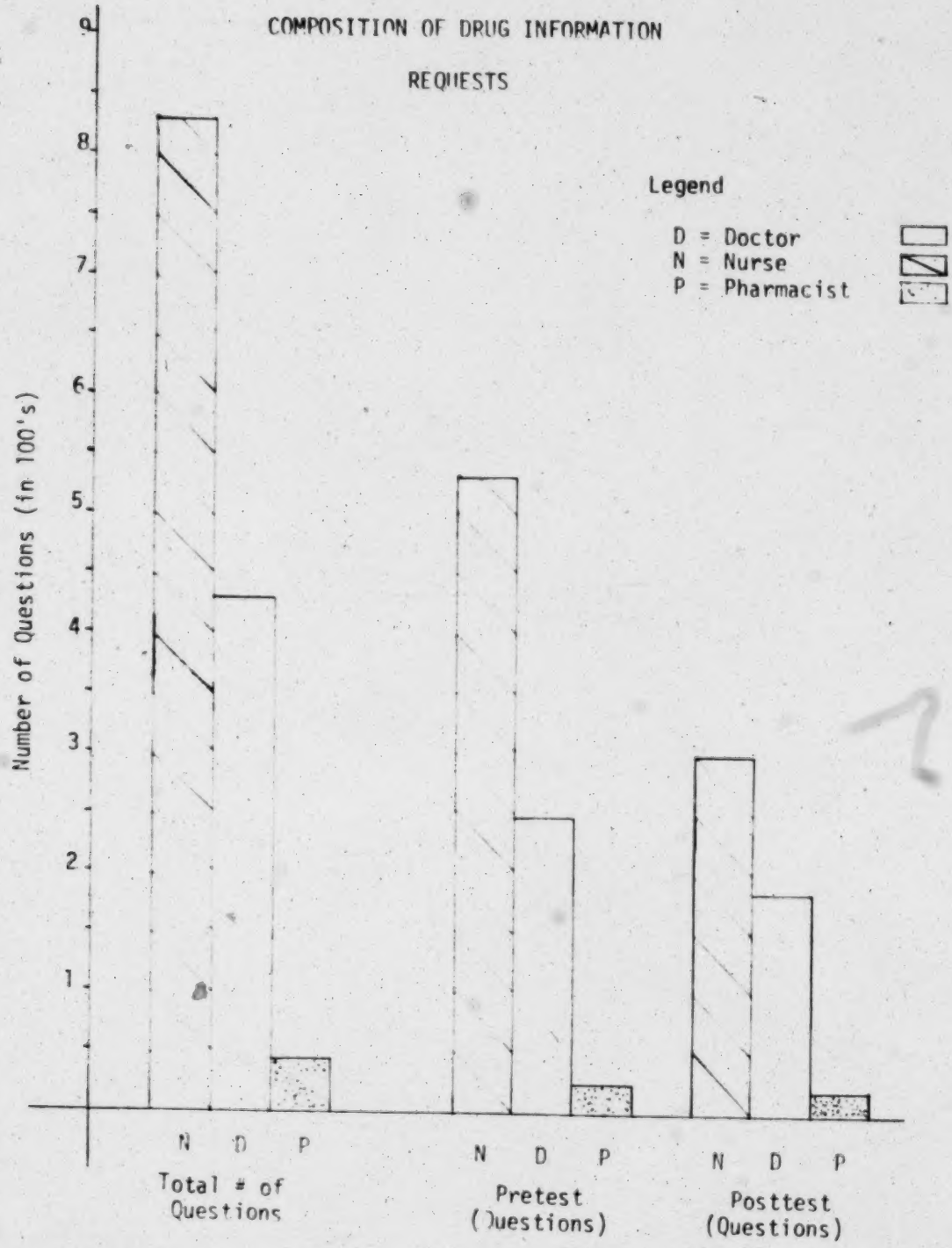
Figure 1 was a graphic representation of the composition of drug information "user". Nurses asked the greatest percentage of questions involving information, followed by doctors and pharmacists. The group designated as "Other" was omitted from the analysis, as mentioned earlier. It was worth noting that the categories of questions asked by "Others" tended to be similar to those asked by the above mentioned groups.

Closer scrutiny of the data indicated that nurses did not ask the majority of questions in all categories; the exceptions were physicians asking the majority of questions about dosage, cost and toxicity of drugs. Doctors and nurses asked equal numbers of questions in the categories of mechanism of action and patient prescription information. Pharmacists required information similar to that of

Figure 1. THE "USER"

COMPOSITION OF DRUG INFORMATION

REQUESTS



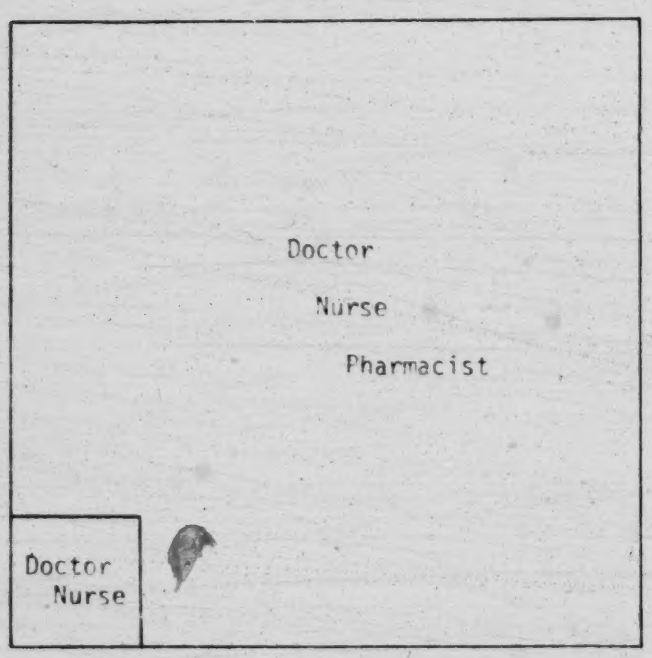
doctors and nurses. Figure 2, however, indicated that there were categories of information specific to doctors and nurses and not required by pharmacists. This included the areas of adverse effects, contra-indications, cost, mechanism of action and side effects of drugs.

Dividing the data further into pre- and posttest situations (Figure 3), there appeared to be no trend change in the type of information supplied. It was noted that because of a decrease in the amount of data in the two groups (pre- and posttest), the doctor-nurse-pharmacist interaction decreased and certain categories of questions became specific to doctors and/or nurses and/or pharmacists. A further division of data, Figure 4, emphasized this point and revealed no drastic trend change in the types or categories of information supplied by hospital pharmacists in the test area. To ensure no trend change occurred as a result of an additional hospital taking part in the posttest, the data for "Other Hospitals" in the posttest situation was also analyzed (Figure 5). However, no trend changes were evident, suggesting that a pharmacist in a patient care area did not alter the type of drug information supplied by pharmacists in the test area.

Further analysis was undertaken in listing each category of question for each file in descending order with respect to the quantity of questions in each category (Table I). As mentioned earlier, there were no drastic changes in the information supplied by hospital pharmacists to doctors, nurses and other pharmacists. Some of the differences (Files 7 and 8) were due to services provided by some hospital pharmacy departments and not by others (i.e., intravenous additive services, drug identification services, and hospital formularies as opposed to drug lists). Table I indicated that there was a lack of questions in

Figure 2. DOCTOR-NURSE-PHARMACIST INTERACTION

TOTAL QUESTIONS



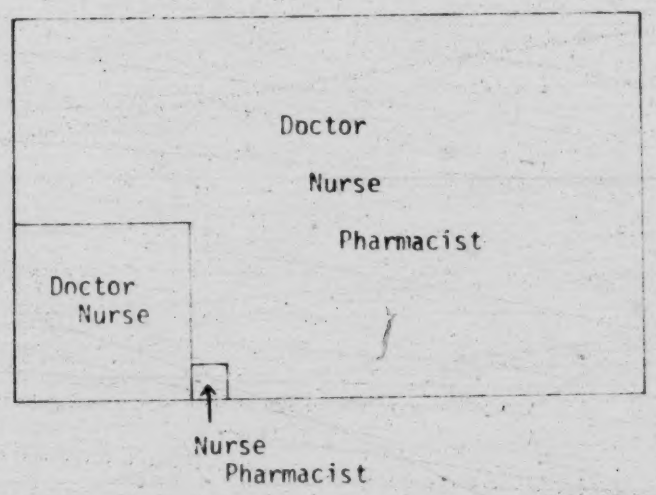
9.2 cm x 9.2 cm = 1303 Q - Total D x N xP

1.9 cm x 1.9 cm = 58 Q of D x N Type

Figure 3.

COMPOSITION OF INFORMATION "USER"

Pretest

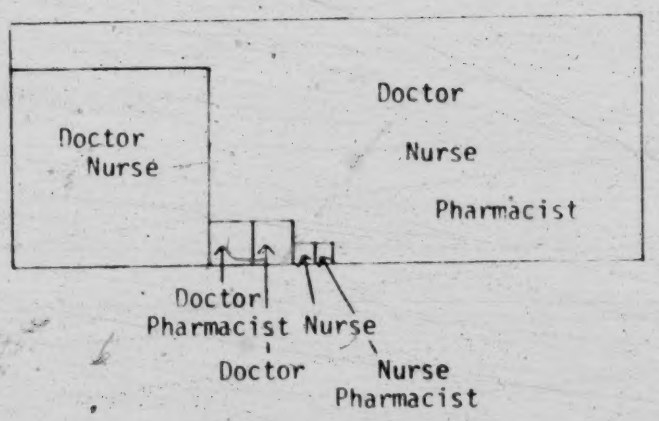


9.2 cm x 5.6 cm = 800 Questions

2.6 cm x 2.6 cm = 103 Questions

0.5 cm x 0.5 cm = 4 Questions

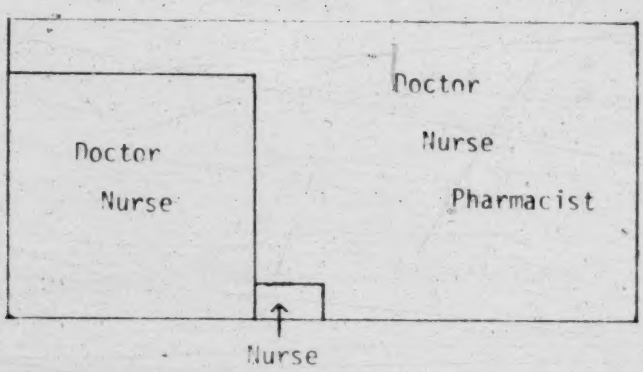
Posttest



9.2 cm x 3.6 cm = 503 Questions
2.9 cm x 2.9 cm = 128 Questions
0.5 cm x 0.5 cm = 5 Questions
0.3 cm x 0.3 cm = 1 Question

Figure 4. PRETEST AND POSTTEST DATA

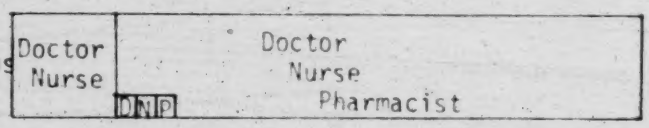
Other Hospitals Pretest



9.2 cm x 4.4 cm = 595 Questions
3.7 cm x 3.7 cm = 205 Questions
1 cm x 0.5 cm = 8 Questions

Test Hospital Pretest

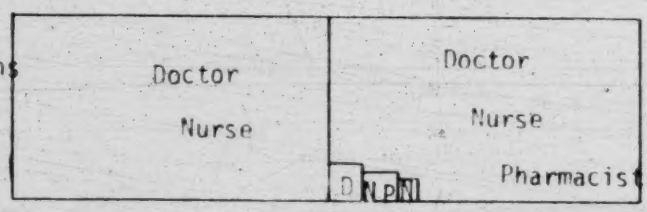
(Does not include questions from category 14 or 16)



9.2 cm x 1.5 cm = 305 Questions
1.5 cm x 1.5 cm = 34 Questions
0.5 cm x 0.3 cm = 2 Questions
0.3 cm x 0.3 cm = 1 Question

Other Hospitals Posttest

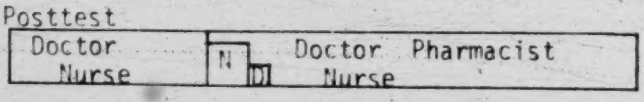
(Does not include questions from categories 13 & 14)



9.2 cm x 2.7 cm = 387 Questions
4.6 cm x 2.7 cm = 187 Questions
0.5 cm x 0.5 cm = 4 Questions
0.5 cm x 0.3 cm = 3 Questions
0.3 cm x 0.3 cm = 1 Question

Test Hospital Posttest

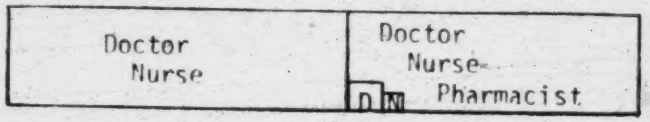
(does not include questions from categories 7, 8, 14)



9.2 cm x 0.8 cm = 116 Questions
2.9 cm x 0.8 cm = 34 Questions
0.5 cm x 0.5 cm = 4 Questions
0.3 cm x 0.3 cm = 1 Question

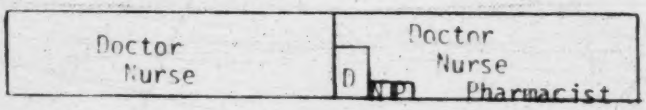
Figure 5. DIVISION OF POSTTEST DATA FROM OTHER HOSPITALS

Others - Posttest (excluding Hospital involved in Posttest only)
(no question 14 category)



9.2 cm x 1.5 cm = 206 Questions
5 cm x 1.5 cm = 120 Questions
0.5 cm x 0.5 cm = 4 Questions
0.3 cm x 0.3 cm = 1 Question

Hospital Involved in Posttest Only (there were no 7, 13, or 14 category questions)



9.2 cm x 1.3 cm = 173 Questions
4.8 cm x 1.3 cm = 193 Questions
0.8 cm x 0.5 cm = 6 Questions
0.3 cm x 0.3 cm = 1 Question

TABLE I

Categories of Request in Descending Order For Files 1-8 *

File 1	File 2	File 3	File 4	File 5	File 6	File 7	File 8
6	12	6	6	10	12	11	11
12	6	12	12	12	11	1	12
10	17	3	11	3	10	17	17
17	11	11	3	11	2	6	6
4	16	9	1	9	6	3	1
3	3	1	9	1	8	5	10
9	10	4	17	4	17	9	3
8	4	10	4	6	3	14	9
12	1	17	5	8	5	16	5
1	9	8	7	5	14	2 - no Q	16
7	15	2	8	17	15	4 - no Q	8
15	2	5	10	2 - no Q	16	7 - no Q	2
2	5	13	2 - no Q	7 - no Q	1	8 - no Q	4
5	13	14	13 - no Q	13 - no Q	4 - no Q	10 - no Q	7
13	14	15	14 - no Q	14 - no Q	7 - no Q	12 - no Q	15
16	8 - no Q	16	15 - no Q	15 - no Q	9 - no Q	13 - no Q	13 - no Q
** 14 - no Q	7 - no Q	7	16 - no Q	16 - no Q	13 - no Q	15 - no Q	14 - no Q

* See Appendix IV to determine category of "request" corresponding to number in above Table.

** no Q - indicates no questions were asked for that category of request.

TABLE II

Categories of Request in Descending Order for Grouped Files *

8 Files	7 Files (all except 2)	Files 3 & 5	Files 4, 6 & 8	Files 1, 3 & 5	Files 2, 4, 6 & 8
6	6	6	6	6	12
12	12	12	12	12	6
11	11	3	11	3	11
3	3	11	17	11	17
17	10	10	1	10	3
10	17	9	3	9	1
1	1	1	10	4	10
9	9	4	9	17	9
4	4	17	2	1	16
8	8	8	5	8	4
16	5	5	8	5	2
5	2	2	4	2	5
2	16	13	16	13	8
15	15	14	7	15	15
7	7	15	15	7	7
13	13	16	14	16	14
14	14	7	no Q in category 13 **	14	13

* See Appendix IV to determine category of "request corresponding to number in above Table.
** no Q - indicates no questions were asked for that category of request.

numerous categories, complicating comparison of results. By grouping the data in various combinations, a more comprehensive picture of the rank order of category of question was seen (Table II). Grouping the data showed a greater similarity amongst the categories of information supplied with respect to the pretest (Files 2, 4, 6 and 8), the posttest (Files 1, 3, and 5) and all the files combined.

The data indicated that fewer questions were asked or recorded in the posttest situation as compared to the pretest. This could have been the result of uncontrolled, extraneous variables in the experimental design such as regression or instrument decay.

The time spent in answering requests in the posttest was increased over that of the pretest (Program 1, Appendix V). This could have been the result of different categories of questions being asked (Files 1 and 2 in Table I). Questions requiring a great amount of time spent in literature searches were asked in File 2 (the posttest observation of the "test hospital") which increased the average posttest time in answering questions (Appendix V, Files 1 and 2).

B. Program 2 (Appendix VI)

Analysis of the data by this program, discussed earlier, showed the percentage distribution of requests made by doctors, nurses, pharmacists and others for all files, as well as an average for all files combined. Files 1 and 2 (Appendix VI) represented the "test hospital" in the pre- and posttest situations respectively. There was a 4.52% decrease in questions asked by physicians in the posttest (not significant) while nurses asked approximately the same percentage of questions in the pre- and posttest situations. In further comparing Files 1 and

2 of this program, there were increases in percentage of questions asked by pharmacists and others (not significant) in the posttest situation. A comparison of all files in this program indicated that pharmacists and others required more drug information at the "test hospital" than at any other hospital participating in the study (Appendix VI).

C. Program 3 (Appendix VII)

In analyzing Files 1 and 2 of this program (the pre- and posttest periods in the "test hospital"), it could be seen that there was a 30 increase in the utilization of references in answering requests for drug information in the posttest as compared to the pretest. As mentioned earlier, pharmacists used the aid of references for only half of the questions recorded for the study. The increased use of references could have been due to experimenter bias where the pharmacist in the patient care area utilized references for all questions in the posttest situation. A pharmacist was not directly involved with a patient care area during the pretest, and thus the experimenter bias, which could not be controlled with this design, could have accounted for the increased use of references in the posttest period at the "test hospital" (Appendix VII, Files 1 and 2).

There was a decrease in the use of references in answering information requests in the posttest period at two other hospitals when comparing their pre- and posttest data (Appendix VII, compare File 3 with File 4 and File 5 with File 6). File 7 contained the pre- and posttest data from the same hospital, while File 8 contained the posttest data from a hospital that participated in the posttest period of the study only. Therefore, comparisons for these two hospitals could

not be obtained from this program. The data from these two hospitals was only used to obtain an overall view of drug information supplied by pharmacies in acute care hospitals in the test area.

D. Program 4 (Appendix VIII)

The results of the analysis using this program emphasized that the telephone was the primary means by which drug information requests were received by pharmacy departments in acute care hospitals in the test area. Overall, less time was spent in answering questions received by telephone as compared to queries communicated in person. There was an increase in time spent answering telephone questions in the posttest situation, while in the "test hospital" more time was spent in answering both telephone questions and queries communicated in person.

CHAPTER IV

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

CHAPTER IV. DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

A. Discussion

1. Evaluation of the Study Method

As mentioned previously, the experimental design chosen for this study was the One Group Pretest - Posttest design. Despite its wide use, there were four or five extraneous variables left uncontrolled with this design (Franklin and Osborne, 1971). In the present study, these variables were recognized as strikes, nursing shortages resulting in the closing of hospital beds, and delay in the transfer of elderly patients from acute care hospitals to nursing home facilities. These factors altered the patient case load and at times placed an increased demand on physicians and nurses. Questions that arose tended to be forgotten, laid aside, or were never asked, and in addition, there appeared to be a decrease in the situations that might prompt the asking of questions involving drug information. The end result was a decrease in the utilization of pharmacists as a source for information and a subsequent decrease in the number of documentation sheets collected.

In applying the null hypothesis, which assumes that no difference exists between the pretest and posttest, the data was grouped to provide an overall view in the trends established in supplying drug information. This grouping increased the amount of data and reduced the effects that these variables would have as rival explanations for any existing differences in the data.

In designing the measuring device for this study, numerous documentation sheets were considered. The literature review and personal communications with pharmacists involved in drug information

services resulted in two criteria being established for designing such a device. The first criterion was the utilization of as many check-lists as possible to minimize writing and facilitate the task of completing the documentation sheets. The second criterion for the device was to have the pharmacist receiving the question or query categorize it. The latter was a problem in other studies (Rising, 1962) and it was felt that the pharmacist receiving the request was the person most capable of categorizing it.

The documentation sheet decided upon (Appendix I) contained three check-lists, one of which was the categorization of the request. The last category in this check-list was "Other" and the majority of requests categorized under this heading dealt with such things as correct spelling of drug names, drug dosage calculations, and stability of pharmaceuticals.

The correct spelling of drug names could be ensured by having adequate compendii, drug lists, hospital formularies or other reference materials available in the patient care areas. However, the latter two problems could be overcome by adequate labelling of pharmaceuticals prior to their leaving pharmacy departments for administration to patients by nurses.

There were two attempts at determining quality of drug information supplied during the study. On the drug information documentation sheet a space was provided for the pharmacist to indicate if he or she felt the drug information supplied was sufficient. Very few sheets collected during the study indicated the information supplied was insufficient.

The second attempt at determining quality of information

supplied was the provision of a form letter (Appendix II) that could be sent to physicians and returned to pharmacy departments via interdepartmental mail services. Pharmacists did not utilize the form letter indicating that physicians would not complete or return such a form to the pharmacy department. These latter indications were not substantiated by sending the form letters to physicians requesting information and must be considered only as speculation on the part of the pharmacists.

One was left to assume that pharmacists did not want to verify the sufficiency of the information they supplied, or that the information supplied could be found in any general reference material, if it were readily available. Another speculation was that pharmacists might not have wanted physicians to know the study was being conducted.

The results of a study such as this could be influenced by the amount of publicity it received. The advertising of this study was limited to personal communications. The pretest portion of the study was explained to the Directors of Pharmacy Departments in acute care hospitals in the test area. These people were then asked if they would participate in the project. No further advertising of the pretest was carried out.

The advertising of the posttest was similar to that of the pretest with two exceptions. In the "test hospital", the study was approved by the Medical Director and advertised to members of the Internal Medicine and Nursing Departments involved in the study.

Another form of personal communication that might be considered was the pharmacist being on the ward. If the physicians and nurses receiving the information were satisfied with it, they would continue to

request information. If the information they received was not sufficient and they were compelled to seek information elsewhere, they would soon discontinue utilizing the pharmacist as an information source.

2. Evaluation of the Clinical Experience

This evaluation was totally subjective as the analysis of the results could not reveal any changes or differences resulting from such experience.

While in the patient care area, the pharmacist attended cardex rounds, physicians' rounds, patient conferences (referred to previously as nursing-patient conferences), and also reviewed patient charts.

It was the opinion of the pharmacist that pharmacists could gain practical experience and more extensive knowledge of drugs and drug therapy by becoming involved in a patient care area. Initially, very few questions were asked of the pharmacist. As the pharmacist became familiar with the medical and nursing staff personnel, more discussions were initiated and more questions were asked. As stated in the study by Bell, Grimes, Bouchard and Gonzales Duffy (1970), the pharmacist felt that in the early part of the study it was necessary to ask questions to initiate discussion.

With respect to questions asked of the pharmacist in the patient care area, he was able to utilize his knowledge of pharmaceutics more often when these were asked by nurses rather than physicians. Nurses, because of their educational background and their constant contact with patients, were more interested in dosage forms of drugs, the manifestation of side effects of drugs, and potential drug interactions. Questions posed by physicians in the patient care area were concerned with cost, mechanism of action and toxic effects of drugs,

as indicated in the results section.

Because the pharmacist moved into this new environment, there was a tendency toward self-inflicted limitations. As a result, a great many references were utilized in providing even the most superficial information. This might have been the reason for the 30% increase in the use of references in the posttest as compared to the pretest at the "test hospital".

Parrott (1962), Wilbur (1968), and others have stated that in such situations, pharmacists tended to emulate a physician's role, rather than maintain a pharmacist's consultant role. This soon became apparent to the pharmacist in the patient care area. By attending rounds in the area and reviewing patient charts, the pharmacist felt he could answer some, but not all, of the questions directed to medical interns and student interns. With other questions which were indirectly related to drug therapy, the pharmacist acknowledged some difficulty in answering these questions. He was of the opinion that he lacked experience in interpreting some of the data (i.e. laboratory results, ECG's, etc.) rather than a lack of knowledge. The accusations of Parrott (1962) and Wilbur (1968) would come to light if the pharmacist considered himself to be in competition with the physician. So that the pharmacist could contribute meaningfully to the health care team, he felt he must maintain the role of drug consultant. In such a role, the pharmacist gained insight into the rationale and philosophy of drug usage in the achievement of desired end results in particular disease states.

Although the pharmacist felt that, at the present time, there did not exist a clearly defined function for pharmacists in the patient

care area, the total experience in the setting afforded pharmacists the opportunity to develop patient specific attitudes which were relative to the needs and use of drug information (Hutchinson and Burkholder, 1971).

3. Evaluation of Pharmacy-Located Information Services

As part of the posttest study, the pharmacist was involved in drug information services in the pharmacy office and the Department of Clinical Pharmacy Education in the "test hospital".

In the "test hospital" the drug information service was housed in the pharmacy office and in the Director of Pharmacy's office. A single telephone, serving both the pharmacy office and the drug information service was situated on a secretary's desk. In the event that the secretary answered the telephone where a question concerning drug information was involved, she could relay the query to a pharmacist for an answer, hand the call over to a pharmacist directly, or, in certain instances, answer the question herself.

The reference material for the service was housed in the Director of Pharmacy's office. In the event that the Director's office was in use and reference material was required, it was difficult for the pharmacist to obtain the needed material. Since the bulk of drug information requests were received in the pharmacy dispensary and transferred to the pharmacy office for answering, it would have been more appropriate to have the majority of references and the telephone for this service situated in the dispensary area. This too, would have assured that the telephone always be answered by a pharmacist and not a secretary.

Involvement in the drug information service in the Clinical Pharmacy Education Department more closely resembled that of the traditional drug information centre. The department was operated by pharmacists and there was always ready access to current references and drug literature. The telephone was used primarily for providing drug information rather than administrative business concerning the department.

4. Evaluation of the Test Data

In comparing the pretest and posttest data of Program 4 for the "test hospital" (Files 1 and 2 of Appendix VIII), there appeared to be approximately a 10% increase ($p < 0.05$) in personal communications in the posttest and an almost equal reduction in the number of telephone questions for the same period. On closer examination of the data in Files 1 and 2 of Program 2 (Appendix VI), it could be seen that this effect was due primarily to requests from pharmacists and others for drug information. Since it was not the result of an increased number of information requests from physicians and nurses, the difference could not be attributed to the involvement of the pharmacist in the patient care area. However, the possibility existed that the effect was due to the efforts of a pharmacist specifically involved in supplying drug information.

B. Conclusions

1. The results of this study indicated that no difference existed in the type of drug information supplied at the "test hospital" and at other hospitals as a result of having a pharmacist involved in a patient care area in the "test hospital".

2. More than one-quarter of the requests for drug information

in the test area involved availability of drugs. The next category of request involving a great deal of time was that of general information about drugs including dosage and dosage forms of drugs.

3. Nurses, as a single group, required drug information most frequently. Physicians ranked second in requesting drug information, and pharmacists asked the fewest number of questions.

4. The telephone was the most frequently used mode of communicating drug information requests. Thus, it was imperative that a telephone line be established solely for this drug information service.

C. Recommendations

The quantitative results of this study indicate that involvement of a pharmacist in a patient care area does not alter the trends in supplying drug information in the "test hospital", or in other hospitals in the test area. The qualitative aspects of information and the clinical experience were not evaluated during this study.

1. There is a need for further study into the supply of drug information on a one-to-one basis in the patient care area. One aspect for further investigation is the establishment of criteria to evaluate the involvement of the pharmacist in discussions which may prevent the asking for requests of information. Another aspect for future study is the utilization of adequate hospital formularies and regular distribution of pharmacy bulletins to patient care areas as the altered variables. Then the effects of these information sources on the trends for supplying information can be determined.

2. There is a need for the greater utilization of statistical methods to analyze data for studies such as this. In planning this

study, a method was devised to determine the quality of the data by ranking the drug information documentation sheets (utilizing a scale of 1 to 4 with 1 being insufficient information and 4 being sufficient information). By having more than two people rank the data, a test for the coefficient of concordance could be applied to the results to determine the agreement or disagreement that existed amongst the people ranking the data. If those ranking the data were in agreement, a statistical test of difference could then be applied to the difference in the sum of ranks of the pre- and posttest data to determine statistical significance of such a difference. One point overlooked at the start of the project was that all the people eligible to rank the data were in favor of and involved in the study. Thus, on the grounds of investigator bias, this method of analysis was not attempted.

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DRUG INFORMATION DOCUMENTATION

Name of Drug(s): _____

REQUEST: Type of Information Requested:

_____ Administration
_____ Policy
_____ Dosage
_____ Dosage Form(s)
_____ Adverse Effects
_____ Availibility
_____ Contraindications
_____ Cost
_____ Formulation
_____ Identification
_____ Incompatibility
_____ General Information
_____ Mechanism of Action
_____ Patient Rx Information
_____ Side Effects
_____ Toxicity
_____ Other _____

QUESTION: Indicate actual question (if appropriate):

SUBSEQUENT QUESTIONS: Initiated by Pharmacist (if appropriate):

ANSWER: Indicate Answer Supplied (in brief):

REFERENCES: Indicate References Used:

SOURCE: Indicate Source of Request:

_____ Physician
_____ Intern or Resident
_____ Medical Student
_____ Nurse
_____ Special Nurse (I.V. team, etc.)
_____ Pharmacist (Community)
_____ Pharmacist (Hospital)
_____ Pharmacist (Clinical)
_____ Other (Indicate)

COMMUNICATION: Indicate How Question Was Received:

_____ Telephone
_____ Personal
_____ Letter
_____ Other (indicate)

TIME SPENT: _____ INFORMATION SUFFICIENT: _____

INFORMATION PHARMACIST: _____

Appendix II

Dear Doctor,

In evaluating the existing Drug Information Facilities, we would like to know if the information supplied to you was adequate.

_____ Yes _____ No

Sincerely,

Pharmacist

P.S. Plese return to the Pharmacy Department.

Appendix III

DRUG INFORMATION REFERENCE LIST - Text Books

1. Alberta Pharmacy Act plus By-laws

2. Antibiotic and Chemotherapy; L.P. Garrod and F. O'Grady; 3rd edition Churchill Livingstone, Edinburgh and London; 1972

3. Antimicrobial Therapy; B.M. Kagan; W.B. Saunders Co., Toronto; 1970

4. Baxter Guide to Fluid Therapy; F.A. Garrett, M.D.: Vice President of Medical Affairs, Baxter Labs of Canada; 1969

5. Bentley's Textbook of Pharmaceutics; H. Davis; 7th edition; Bailliere, Tendall and Cox, London; 1961

6. Bio-Pharmaceutics and Relevant Pharmaco-Kinetics; J.G. Wagner; 1st edition, Drug Intelligence Publications, Hamilton, Ill.; 1971

7. British Pharmaceutical Codex, 1968, Supplement 1971 ibid

8. Canadian Formulary, 1949

9. Clinical Pharmacology; K.L. Melman, H.F. Morrelli; The MacMillan Co.; 1972.

10. Clinical Pharmacy Handbook; H.F. Kabat; Lea and Febiger; Philadelphia; 1969

11. Clinical Toxicology of Commercial Products; M.G. Gleason, R.E. Gosselin, H.C. Hodge, R.P. Smith; 3rd edition; The Williams and Wilkins Company, Baltimore; 1969

12. Compendium of Pharmaceuticals and Specialities; 1973 edition

13. Compatibilities and Incompatibilities of Multiple Intravenous Admixture; Jean Wood, St. Joseph's Hospital, Hamilton, Ontario; 1968-69

14. Current Diagnosis and Treatment; M.A. Krupp, M.J. Chatton; Lange Medical Publications, Los Altos, Calif.; 1973

15. Diagnostic Tests - From Triangle the Sandoz Journal of Medical Science, Vol. IV, No. 6 - Vol. VII, No. 8

16. Drug Evaluations - A.M.A. 1971; American Medical Association, Chicago; 1st edition

17. Drug Index, American; C.O. Wilson, T.E. Jones; J.B. Lippincott Co., Philadelphia; 1972

18. Drug Interactions; P.D. Hansten; Lea and Febiger, Philadelphia; 1971

19. Documenta Geigy

20. Drug Interactions-1, Abstracts on; From International Pharmaceutical Abstracts, American Society of Hospital Pharmacists; 1971

21. Extra Pharmacopoeia, Martindale; R.G. Todd; Council of the Pharmaceutical Society of Great Britain; 26th edition; The Pharmaceutical Press, London; 1967

22. Food and Drugs Act and Regulations; The Health Protection Branch of the Department of National Health and Welfare; Queen's Printer of Canada, Ottawa, Canada; 1971

23. Formulary for the Ottawa Civic Hospital; 1972 edition

24. Guide to Recognition and Treatment of Overdosage; Lederle Laboratories, Pearl River; 1964

25. Handbook of Drug Interactions; E. Hartshorn; published by Drug Intelligence Publications

26. Handbook of Non-Prescription Drugs; G.B. Griffen Lagen, L.L. Hawkins; American Pharmaceutical Association; 1971

27. Handbook of Pharmacology; W.C. Cutting; 4th edition; Appelton-Century-Crofts, New York; 1969

28. Hazards of Medication; F.W. Martin; J.B. Lippincott Co., Philadelphia; 1971

29. Human Drug Interactions, A Documented, Cross-Indexed Manual, To; N.J. Sawyer, C.M. King, R.A. Hellums; Department of Pharmacy, University of Alabama Hospitals and Clinics; 2nd edition; 1971

30. Infection in Hospital: A Code of Practice; 1971; F.S. Livingstone

31. Intravenous Therapy; J.T. Williams, D.F. Moravec; Clissold Publishing Co.; July 1970

32. Laboratory Tests in Common Use; S. Garb; Springer Publishing Co. Inc., New York; 1956

33. Manual of Medical Therapeutics; M.G. Rosenfeld; Washington University; Little, Brown and Co., Boston; 20th edition; 1971

34. Medical Dictionary - Dorland's Illustrated

35. Medical Physiology, A Textbook of; 3rd edition; A.C. Guyton; W.B. Saunders Co., Philadelphia, Pa.; August 1969

36. Medicinal Plant Alkaloids; S.K. Sim; 2nd edition; University of Toronto Press, Toronto; 1965

37. Merck Index, The; Merck, Sharp & Dohme Research Laboratories; 8th edition; 1968

38. Merck Manual, The; Merck, Sharp & Dohme Research Laboratories; 11th edition; 1966

39. Microbiology Textbook

40. National Formulary, The; 11th edition; 1970; American Pharmaceutical Association

41. Non-Medical Use of Drugs, Interim Report of the Commission of Inquiry into the; Department of National Health and Welfare, Queen's Printer, Ottawa, Canada; 1970

42. Parenteral Administration; Abbott Laboratories Ltd., Montreal, P.Q.; August 1971

43. Pathology; S.L. Robbins; W.B. Saunders Co., Philadelphia, Pa.; 1967

44. Pediatric Dosage Handbook; H.C. Shirkey; American Pharmaceutical Association; 1971

45. Pediatrics, Handbook of; H.K. Silver, C.H. Kempe, H.B. Bruyn; Lange Medical Publications, Los Altos, Calif.; 1969

46. Pharmacognosy, A Textbook of

47. Pharmacological Basis of Therapeutics, The; L.S. Goodman, A. Gilman; 4th edition; The MacMillan Co., London; 1970

48. Pharmacology and Therapeutics; A. Grollman, E.F. Grollman; 7th edition; Lea and Febiger, Philadelphia; 1970

49. Pharmacopoeia Internationalis; World Health Organization; 1st edition; Geneva; 1955

50. Pharmacopoeia of the United States of America, The; 16th edition; Mack Publishing Co., Easton, Pa.; 1960

51. Physiological Basis of Medicinal Practice; C.H. Best, N.B. Taylor; 8th edition; The Williams and Wilkins Co., Baltimore; 1966

52. Poison Control Booklet - Warner-Chilcott Products

53. Poisoning, Handbook of; R.H. Dreisback; Lange Medical Publications, Los Altos, Calif.; 1971

54. Product Identification Guide in Clinical Pharmacy Services Office

55. Products in the Service of Medicine; Connaught Medical Research Laboratories, Willowdale, Ontario; 1972

56. Product Manual for Poison Control; Hoffmann-La Roche Limited, Montreal, P.Q.

57. Remington's Pharmaceutical Sciences; E.W. Martin; 7th edition; The Mack Publishing Co., Easton, Pa.; 1965

58. Side Effects of Drugs; Williams and Wilkins Co., Vol. 6, Excerpta Medica Foundation; 1968

59. Solutions and Dosage of Drugs, Workbook of; E.M. Anderson; 7th edition; The C.V. Mosby Co., St. Louis; 1964

60. Symptoms and Treatment of Overdosage; Abbott Laboratories, North Chicago; 1960

61. The Systemic Identification of Organic Compounds, A Laboratory Manual; P.L. Shriner, R.C. Fuson, D. Curtin, John Weley and Sons; 5th edition; 1965

62. Toxicity Data and Instructions for Care in Overdosage; Searle

63. Textbook of Pharmaceutical Arithmetic, A; Dean M.J. Huston; 1950

64. United States Dispensary; Osol-Farrar; 24th edition; J.B. Lippincott Co.; 1947

Journals

1. American Journal of Hospital Pharmacy; G.P. Provost, Editor; published by American Society of Hospital Pharmacists

2. Bulletin Rx; Dr. C. Boyd

3. Canadian Hospital; B.L.P. Brosseau, Editor; published by the Canadian Hospital Association

4. Canadian Journal of Hospital Pharmacy; J.L. Summers, Editor; published by the Canadian Society of Hospital Pharmacists

5. Clin-Alert; published by the Science Editors, Inc., Louisville, Kentucky

6. Clinical Experience Abstracts, FDA; published by the U.S. Food and Drug Administration, Department of Health, Education and Welfare, Vol. 1, No. 1, 1962

7. Clinical Pharmacology and Therapeutics; Walter Modell, Editor; published by the C.V. Mosby Co., St. Louis, Missouri

8. Clinical Pharmacology, The Journal of; McKeen Cattell, Editor; published by the Hall Associates, Stamford, Connecticut

9. Clinical Symposia; R.H. Roberts; Ciba-Geigh Corporation, Dorval, Quebec

10. Drug Intelligence and Clinical Pharmacy; D.E. Francke, Editor; published by Drug Intelligence and Clinical Pharmacy, Inc.

11. Drugs; G.S. Avery, Editor; published in Switzerland

12. Facts and Comparisons; E.K. Kastrup, Editor; Fact and Comparisons, Inc., St. Louis, Missouri

13. Horner Hospital Newsletter; published by F.W. Horner, Ltd., Montreal, Quebec

14. Hospital Administration in Canada; J. Boyd, Editor; published by the Southam Business Publications, Ltd.

15. Hospital Pharmacy Notes; Dr. G.J. Sperandio, Editor; published by Eli Lilly and Co.

16. Hospital Pharmacy "The White Sheet"; published and issued by Phillips Roxane Laboratories Inc., Columbus, Ohio

17. Lippincott's Hospital Pharmacy; Neil M. Davis, Editor; published by J.B. Lippincott Co., Philadelphia

18. Medical Clinics of North America, The; H.F. Conn, Guest Editor; W.B. Saunders Co., Toronto

19. Medical Letter, The; published by Drug and Therapeutic Information Inc., New York, N.Y.

20. Postgraduate Medicine; The Journal of Applied Medicine; D.L. Wilbur, Editor; Minneapolis, Minnesota

21. Rational Drug Therapy; American Society for Pharmacology and Experimental Therapeutics; published by W.B. Saunders Co.

22. Triangle; published by Sandoz Ltd., Basel, Switzerland

23. Unlisted Drugs; B.R. Anzlowar, Editor; published in cooperation with the Pharmaceutical Division, Special Libraries Association

Appendix IV

DRUG INFORMATION DOCUMENTATION

Name of Drug(s): _____

REQUEST: Type of Information Requested:

1	Administration	10	Identification
2	Policy	11	Incompatibility
3	Dosage	12	General Information
4	Dosage Form(s)	13	Mechanism of Action
5	Adverse Effects	14	Patient Rx Information
6	Availibility	15	Side Effects
7	Contraindications	16	Toxicity
8	Cost	17	Other
9	Formulation		

QUESTION: Indicate actual question (if appropriate):

SUBSEQUENT QUESTIONS: Initiated by Pharmacist (if appropriate):

1 = Yes
0 = No

ANSWER: Indicate Answer Supplied (in brief):

REFERENCES: Indicate References Used:

1. American Hospital Formulary Service
2. C.P.S.
3. Goodman & Gilman
4. Martindale's Extra Pharmacopeia
5. Other
6. No References
7. Handbook of Drug Interactions
8. Combination of any or all of the above (except 6)

SOURCE: Indicate Source of Request:

1	Physician	6	Pharmacist (Community)
2	Intern or Resident	7	Pharmacist (Hospital)
3	Medical Student	8	Pharmacist (Clinical)
4	Nurse	9	Other (Indicate)
5	Special Nurse (I.V. team, etc.)		

COMMUNICATION: Indicate How Question Was Received:

1	Telephone	3	Letter
2	Personal	4	Other (indicate)

TIME SPENT: ___ hrs ___ min ___ sec INFORMATION SUFFICIENT: _____

INFORMATION PHARMACIST: _____

Appendix V

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*" A
C:FOCAL-11,LFOCA-A

  1.01 E
  1.10 T !!"FRED RUMPLE - PROGRAM 1"!!
  1.12 A "DECK # "D," FILE # "N!
  1.14 T !!"HIT SPACE BAR WHEN THAT DECK IS READY"!!
  1.16 X FCHR(-1);N DRD;N DWD;I (NN-2)1.2
  1.18 F I=1,NN-1;N DSD
  1.20 N DEND;N DRD

  2.10 S TP=F636(0)
  2.20 F I=1,TP;D 5
  2.30 F I=1,17;F J=0,9;D 6

  3.10 V N;T !!!!"HOSPITAL FILE # "%1,N!;V Z
  3.15 T !!"TOTAL NUMBER OF REQUESTS MADE "%4,TP
  3.17 T !"TOTAL TIME SPENT ON REQUESTS ";S ZZ=TT;D 8
  3.19 T !"AVERAGE TIME SPENT PER REQUEST ";S ZZ=TT/TP;D 8
  3.20 T !!"PERCENTAGE DISTRIBUTION OF REQUESTS WITH TYPE OF USER"!
  3.22 D 9;V N
  3.25 F I=1,17;D 10
  3.50 T !!!;D 3.1;
  3.52 T !!"TABLE INDICATING FREQUENCY THAT SUBSEQUENT QUESTIONS"
  3.53 T " WERE ASKED"!
  3.55 D 9;V N
  3.57 F I=1,17;D 11
  3.60 T !"TABLE OF AVERAGE TIME SPENT IN MINUTES ANSWERING"
  3.62 T " REQUESTS"!;L 9
  3.64 F I=1,17;D 12
  3.66 V E;T !!!!!!!!!!!;Q

  5.10 S CH=(I-1)*7;S XX=F636(CH+1);S YY=F636(CH+4)
  5.15 S AA(XX,YY)=AA(XX,YY)+1
  5.20 I (-F636(CH+2))5.3,5.4
  5.30 S BB(XX,YY)=BB(XX,YY)+1;S BB(XX,0)=BB(XX,0)+1
  5.40 S CC(XX,YY)=CC(XX,YY)+F636(CH+7)/60
  5.50 S TT=TT+F636(CH+7)
  5.60 S AA(XX,0)=AA(XX,0)+1
  5.65 S CC(XX,0)=CC(XX,0)+F636(CH+7)/60
  5.70 R

  6.05 I (AA(I,J))6.1,4.3
  6.10 S CC(I,J)=CC(I,J)/AA(I,J)
  6.20 S BB(I,J)=100*BB(I,J)/AA(I,J)
  6.30 S AA(I,J)=100*AA(I,J)/TP
  6.40 R
```

```
8.10 S TH=FITR(ZZ/3600);S TM=FITR((ZZ-3600*TH)/60)
8.20 S TS=ZZ-TH*3600-TM*60
8.30 T %4,TH," HRS  ";V N;T %2,TM," MINS  ",TS," SECS";V E
8.40 R

9.10 T !"                                                  P      P"
9.12 T "      P"!"              P                                  "
9.13 T "H C    H      H"!"              H       R                  "
9.14 T "          A O    A H    A C"!"R            Y       E    M S"
9.15 T "           S      R M    R O    R L"!"E            S     "
9.16 T "I S    E T            P      M M    M S    M I"!"Q    T     "
9.17 T " I     N I    D U     N     E N    A U    A P    A N     O"!
9.18 T "U    O      C     T D    I D     U     C U    C N    C I   "
9.19 T " C I     T"!"E    T      I     E E    C E     R     I R    "
9.20 T "I I    I T    I C     H"!"S    A      A     R N    A N     "
9.21 T "S     A S    S T    S A    S A     E"!"T    L      N     "
9.22 T "N T    L T     E     L E    T Y    T L    T L     R"!!
9.30 R

10.10 T %2,I," ";S J=-1
10.20 S J=J+1;I (AA(I,J))10.3,10.3,10.4
10.30 I (8-J)10.35;T "        ";G 10.2
10.35 T !;R
10.40 T %4.02,AA(I,J);I (8-J)10.45;T "% ";G 10.2
10.45 R

11.10 T %2,I," ";S J=-1
11.20 S J=J+1;I (BB(I,J))11.3,11.3,11.4
11.30 I (8-J)11.35;T "        ";G 11.2
11.35 T !;R
11.40 T %4.02,BB(I,J);I (8-J)11.45;T "% ";G 11.2
11.45 R

12.10 T %2,I," ";S J=-1
12.20 S J=J+1;I (CC(I,J))12.3,12.3,12.4
12.30 I (8-J)12.35;T "        ";G 12.2
12.35 T !;R
12.40 I (8-J)12.45;T %5.01,CC(I,J)," ";G 12.2
12.45 T %4.01,CC(I,J);R
```

```
*GO

FRED PUMPLE - PROGRAM 1

DECK # :1    FILE # :1

HIT SPACE BAR WHEN THAT DECK IS READY


HOSPITAL FILE # 1

TOTAL NUMBER OF REQUESTS MADE =  249
TOTAL TIME SPENT ON REQUESTS =   73 HRS  29 MINS   0 SECS
AVERAGE TIME SPENT PER REQUEST =    0 HRS  17 MINS  42 SECS

PERCENTAGE DISTRIBUTION OF REQUESTS WITH TYPE OF USER
```

REQUEST	TOTAL	PHYSICIAN	INTERN	RESIDENT	MEDIDAL	STUDENT	NURSE	SPECIAL	ENCUIRAS	PHARMACIST	PHARMACOMMUNICATY	PHARMACIST	PHARMACOMMUNICATY	PHARMACIST	CLINICIAN	OTHER
1	2.41%		0.40%				1.20%	0.40%				0.40%				
2	0.40%											0.40%				
3	5.22%	0.80%	1.61%				2.01%					0.40%				
4	5.62%	0.80%	0.40%		0.40%		3.21%	0.40%				0.40%				0.40
5	0.40%	0.40%														
6	30.52%	5.22%	5.22%		0.40%		14.06%	0.40%		0.40%		0.40%		0.40%		4.02
7	0.80%	0.40%					0.40%									
8	4.42%	2.01%	0.40%		0.80%			0.40%								0.80
9	4.82%		0.80%				1.20%	0.40%		0.40%						2.01
10	9.03%	2.41%	0.40%				2.81%	0.40%				0.40%				1.61
11	4.42%		0.80%				3.21%	0.40%								
12	25.30%	3.61%	2.01%		0.40%		10.84%	0.80%		0.80%		0.40%				6.43
13	0.40%	0.40%														
14																
15	0.80%						0.40%									0.40
16	0.40%															0.40
17	6.02%	0.80%	0.80%				2.01%	0.40%				0.40%				1.61

HOSPITAL FILE # 1

TABLE INDICATING FREQUENCY THAT SUBSEQUENT QUESTIONS WERE ASKED

RESPONSE	TOTAL	PHYSICIAN	INTERN	RESIDENT	MEDICAL STUDENT	NURSE	SPECIAL	NUCUR	PHARMACOMMUNITY	PHARMACOMMUNITY SAPTIL	PHARMACLINICAL	OTHER
1	16.67%									100.0%		
2	100.0%									100.0%		
3	38.46%		50.00%			20.00%				100.0%		100.0
4	21.43%	50.00%				12.50%				100.0%		
5												
6	23.68%	30.77%	38.46%			20.00%						20.00
7												
8	36.36%	20.00%	100.0%	50.00%								50.00
9	41.67%		100.0%			33.33%	100.0%					20.00
10	35.00%					28.57%	100.0%			100.0%		75.00
11	27.27%					25.00%	100.0%					
12	29.57%	11.11%	20.00%			33.33%			50.00%			37.50
13												
14												
15	100.0%					100.0%						100.0
16	100.0%											100.0
17	13.33%					20.00%				100.0%		

TABLE OF AVERAGE TIME SPENT IN MINUTES ANSWERING REQUESTS

RESPONSE	TOTAL	PHYSICIAN	INTERN	RESIDENT	MEDICAL STUDENT	NURSE	SPECIAL	NUCUR	PHARMACOMMUNITY	PHARMACOMMUNITY SAPTIL	PHARMACLINICAL	OTHER
1	14.8		2.0			5.7	60.0			10.0		
2	10.0									10.0		
3	3.7	2.3	7.5			1.2				2.5		5.0
4	9.7	5.1	20.0	10.0		2.0	2.0			2.0		
5	2.0	2.0										
6	2.3	4.1	2.0	5.0		1.6	3.0	10.0		5.0	0.2	1.0
7	5.5	1.0				10.0						
8	5.4	7.4	12.5	2.5			2.0					1.5
9	3.7		3.3			3.6	1.0	2.0				4.9
10	171.5	324.6	5.0			207.0	1.0			1.0		3.8
11	3.7		1.5			4.2	4.0					
12	4.3	5.8	3.2	3.0		3.5	1.5	6.3		5.0		5.3
13	1.0	1.0										
14												
15	6.3					2.5						10.0
16	10.2											10.0
17	4.7	12.5	5.0			2.2	5.0			10.0		2.3

```
?18 AT  6.30
*L L1,1
*L L1,3
*GO

FRED PUMPLE - PROGRAM 1

DECK # :1
  FILE # :2

HIT SPACE BAR WHEN THAT DECK IS READY



HOSPITAL FILE # 2

TOTAL NUMBER OF REQUESTS MADE =  147
TOTAL TIME SPENT ON REQUESTS =  155 HRS  45 MINS  49 SECS
AVERAGE TIME SPENT PER REQUEST =    1 HRS   3 MINS  35 SECS

PERCENTAGE DISTRIBUTION OF REQUESTS WITH TYPE OF USER
```

REQUEST	TOTAL	PHYSICIAN	INTERN	RESIDENT	MEDICAL	STUDENT	NURSE	SPECIAL NURSE	PHARMACIST	COMMUNITY	PHARMACIST	HOSPITAL	PHARMACIST	CLINICAL	OTHER
1	2.72%						0.68%	1.36%							0.68
2	1.36%						0.68%								0.68
3	6.12%	0.68%	1.36%				1.36%	2.04%							0.68
4	4.76%	1.36%					2.04%				0.68%				0.68
5	0.68%						0.68%								
6	15.65%	2.72%	0.68%				7.48%	1.36%			1.36%				2.04
7															
8															
9	2.72%	0.68%					0.68%	0.68%							0.68
10	5.44%	1.36%					1.36%								2.72
11	7.48%	1.36%					6.12%								
12	33.33%	6.12%	4.08%		1.36%		11.56%	0.68%	1.36%		2.72%				5.44
13	0.68%	0.68%													
14	0.68%														0.68
15	2.04%	0.68%			0.68%		0.68%								
16	6.80%	1.36%	0.68%				2.04%								2.72
17	9.52%	0.68%			0.68%		2.72%		0.68%		0.68%				4.08

HOSPITAL FILE # 2

TABLE INDICATING FREQUENCY THAT SUBSEQUENT QUESTIONS WERE ASKED

REQUEST	TOTAL	PHYSICIAN	INTERN	RESIDENT	MEDICAL STUDENT	NURSE	SPECIALIST	PHARMACY	PHARMACOMMUNICATIST	PHARMACOMMUNICATY	PHARMACIST	PHARMACIST	PHARMACIST	OTHER
1	50.00%					100.0%	50.00%							
2														
3	33.33%		50.00%				66.67%							
4	42.86%	50.00%				33.33%					100.0%			
5														
6	8.70%					9.09%					50.00%			
7														
8														
9														
10	37.50%					50.00%								50.00
11	27.27%	50.00%				22.22%								
12	30.61%	22.22%	16.67%	50.00%		11.76%	100.0%	100.0%	50.00%					50.00
13														
14	100.0%													
15	66.67%				100.0%	100.0%								100.0
16	60.00%	50.00%	100.0%			33.33%								75.00
17	35.71%					25.00%			100.0%	100.0%				33.33

TABLE OF AVERAGE TIME SPENT IN MINUTES ANSWERING REQUESTS

REQUEST	TOTAL	PHYSICIAN	INTERN	RESIDENT	MEDICAL STUDENT	NURSE	SPECIALIST	PHARMACY	PHARMACOMMUNICATIST	PHARMACOMMUNICATY	PHARMACIST	PHARMACIST	PHARMACIST	OTHER
1	18.0					2.0	32.5							5.0
2	0.8					0.5								1.0
3	8.1	3.0		3.5		3.5	18.3							1.0
4	19.0	31.0				2.0					60.0			5.0
5	2.0					2.0								
6	5.3	2.3		3.0		4.0	1.8				2.6			19.3
7														
8														
9	4.5	2.0				3.0	3.0							10.0
10	6.9	3.0				6.5								9.0
11	5.1	6.0				4.9								
12	111.9	21.0		8.2	3.5	24.3	20.0		155.0		490.1			317.1
13	60.0	60.0												
14	3.0													
15	21.3	60.0			2.0	2.0								3.0
16	11.3	7.5		5.0		7.7								17.5
17	220.5	120.0			2.0	9.1			0.5		15.0			485.6

```
*GO

FRED RUMBLE - PROGRAM 1

DECK # :1    FILE # :3

HIT SPACE BAR WHEN THAT DECK IS READY
```

HOSPITAL FILE # 3

TOTAL NUMBER OF REQUESTS MADE = 509
TOTAL TIME SPENT ON REQUESTS = 12 HRS 44 MINS 5 SECS
AVERAGE TIME SPENT PER REQUEST = 0 HRS 1 MINS 30 SECS

PERCENTAGE DISTRIBUTION OF REQUESTS WITH TYPE OF USER

REQUEST	TOTAL	PHYSICIAN	INTERN	RESIDENT	MEDICAL	STUDENT	NURSE	SPECIAL	NURSE	PHARMACIST	PHARMACY	PHARMACOMMUNICATIST	PHARMACAL	PHARMACIAL	OTHER
1	4.32%	0.39%		0.20%			3.73%								
2	0.79%						0.79%								
3	13.56%	3.93%		2.36%			7.27%								
4	3.54%	0.39%		0.39%			2.75%								
5	0.59%						0.39%		0.20%						
6	40.28%	7.27%		1.57%		0.20%	30.65%				0.20%		0.20%		0.20
7	0.20%						0.20%								
8	1.18%	0.39%		0.20%			0.39%								0.20
9	5.11%	2.16%		0.20%			2.55%				0.20%				
10	3.34%	0.20%					2.36%				0.59%				0.20
11	7.07%	0.39%		0.20%		0.20%	6.09%		0.20%						
12	14.93%	1.96%		2.16%			9.04%		0.59%		0.20%		0.20%		0.79
13	0.59%						0.20%		0.20%						0.20
14	0.39%	0.20%		0.20%											
15	0.39%			0.20%					0.20%						
16	0.39%			0.20%			0.20%								
17	3.34%			0.20%			2.75%						0.20%		0.20

HOSPITAL FILE # 3

TABLE INDICATING FREQUENCY THAT SUBSEQUENT QUESTIONS WERE ASKED

REQUEST	TOTAL	PHYSICIAN	INTERN	RESIDENT	MEDICAL	STUDENT	NURSE	SPECIAL	NURSE	PHARMACIST	COMMUNITY	PHARMACIST	HOSPITAL	PHARMACIST	CLINICAL	OTHER
1	27.27%	100.0%					21.05%									
2	25.00%						25.00%									
3	28.99%	45.00%	41.67%				16.22%									
4	16.67%						21.43%									
5	33.33%						50.00%									
6	14.15%	27.03%	25.00%				10.90%									
7																
8	16.67%	50.00%														
9																
10	11.76%									33.33%						100.0
11	13.89%						16.13%									
12	7.89%	10.00%	18.18%				4.35%									25.00
13																
14																
15	50.00%		100.0%													
16																
17	11.76%						14.29%									

TABLE OF AVERAGE TIME SPENT IN MINUTES ANSWERING REQUESTS

REQUEST	TOTAL	PHYSICIAN	INTERN	RESIDENT	MEDICAL	STUDENT	NURSE	SPECIAL	NURSE	PHARMACIST	COMMUNITY	PHARMACIST	HOSPITAL	PHARMACIST	CLINICAL	OTHER
1	1.8	9.0	1.0				1.0									
2	1.3						1.3									
3	1.7	2.0	1.7				1.4									
4	1.6	1.0	10.5				0.5									
5	3.3						3.5	3.0								
6	1.0	2.8	1.3		3.0		0.5			3.0		1.0				3.0
7	1.0						1.0									
8	1.7	2.0	2.0				0.6									3.0
9	0.8	1.1	3.0				0.5			1.0						
10	2.1	2.0					2.3			1.0						2.0
11	1.6	1.2	1.0		1.0		1.7	0.3								
12	1.2	1.3	2.5				0.8	4.0		0.3		1.0				1.0
13	4.3						1.0	2.0								10.0
14	1.5	1.0	2.0													
15	37.5		15.0					60.0								
16	3.5		4.0				3.0									
17	2.6		0.5				3.0					1.0				1.0

*GO

FRED PUMPLE - PROGRAM 1

DECK # :1
FILE # :4

HIT SPACE BAR WHEN THAT DECK IS READY

HOSPITAL FILE # 4

TOTAL NUMBER OF REQUESTS MADE = 175
TOTAL TIME SPENT ON REQUESTS = 7 HRS 3 MINS 0 SECS
AVERAGE TIME SPENT PER REQUEST = 0 HRS 2 MINS 25 SECS

PERCENTAGE DISTRIBUTION OF REQUESTS WITH TYPE OF USER

REQUEST	TOTAL	PHYSICIAN	INTERN	RESIDENT	MEDICAL	STUDENT	NURSE	SPECIAL	NURSE	PHARMACIST	COMMUNITY	PHARMACIST	HOSPITAL	PHARMACIST	CLINICAL	OTHER
1	6.86%	0.57%					6.29%									
2																
3	8.00%	2.29%	1.71%				4.00%									
4	1.71%	1.14%					0.57%									
5	0.57%						0.57%									
6	38.29%	10.86%	2.29%		0.57%		24.00%									0.57
7	0.57%						0.57%									
8	0.57%	0.57%														
9	3.43%	0.57%			0.57%		2.29%									
10	0.57%		0.57%													
11	12.57%						12.57%									
12	24.57%	2.29%	1.14%				17.14%	0.57%		1.14%		0.57%				1.71
13																
14																
15																
16																
17	2.29%						2.29%									

HOSPITAL FILE # 4

TABLE INDICATING FREQUENCY THAT SUBSEQUENT QUESTIONS WERE ASKED

REQUEST	TOTAL	PHYSICIAN	INTERNE	RESIDENT	MEDICAL	SUTURE	NURSE	SPECIAL	SENCUR	PHARMACY	PHARMACOMMAUNITY	PHARMACIST	PHARMACIST	CLINICAL	OTHER
1	8.33%						9.09%								
2															
3	7.14%	25.00%													
4	33.33%	50.00%													
5															
6	7.46%	26.32%													
7															
8															
9															
10															
11	9.09%						9.09%								
12	6.98%						3.33%			50.00%					33.33
13															
14															
15															
16															
17															

TABLE OF AVERAGE TIME SPENT IN MINUTES ANSWERING REQUESTS

REQUEST	TOTAL	PHYSICIAN	INTERNE	RESIDENT	MEDICAL	SUTURE	NURSE	SPECIAL	SENCUR	PHARMACY	PHARMACOMMAUNITY	PHARMACIST	PHARMACIST	CLINICAL	OTHER
1	2.5	1.0					2.6								
2															
3	4.4	8.6		5.8			1.3								
4	0.8	1.0					0.5								
5	2.0						2.0								
6	3.2	9.4		2.[illegible]		1.0	0.6								0.3
7	1.0						1.0								
8	1.0	1.0													
9	1.0	2.0				1.0	0.8								
10	1.0			1.0											
11	2.4						2.4								
12	1.2	0.8		2.8			1.1		1.0		2.0		0.5		0.8
13															
14															
15															
16															
17	0.6						0.6								

*GO

FRED PUMPLE - PROGRAM 1

DECK # :1 FILE # :5

HIT SPACE BAR WHEN THAT DECK IS READY

HOSPITAL FILE # 5

TOTAL NUMBER OF REQUESTS MADE = 77
TOTAL TIME SPENT ON REQUESTS = 30 HRS 20 MINS 0 SECS
AVERAGE TIME SPENT PER REQUEST = 0 HRS 23 MINS 38 SECS

PERCENTAGE DISTRIBUTION OF REQUESTS WITH TYPE OF USER

REQUEST	TOTAL	PHYSICIAN	INTERN	PESIDENT	MEDICAL	STUDENT	NURSE	SPECIAL	NURSE	PHARMACIST	COMMUNITY	PHARMACIST	HOSPITAL	PHARMACIST	CLINICAL	OTHER
1	6.49%	1.30%					2.60%	2.60%								
2																
3	12.99%	9.09%					3.90%									
4	3.90%						2.60%									1.30
5	2.60%		1.30%		1.30%											
6	3.90%	3.90%														
7																
8	3.90%		2.60%													1.30
9	7.79%	2.60%	1.30%				2.60%									1.30
10	23.38%	7.79%					14.29%									1.30
11	11.69%	1.30%					5.19%	5.19%								
12	20.78%	6.49%	2.60%				10.39%									1.30
13																
14																
15																
16																
17	2.60%	1.30%										1.30%				

HOSPITAL FILE # 5

TABLE INDICATING FREQUENCY THAT SUBSEQUENT QUESTIONS WERE ASKED

REQUEST	TOTAL	PHYSICIAN	INTERN	RESIDENT	MEDICAL	STUDENT	NURSE	SPECIAL	NURSE	PHARMACIST	COMMUNITY	PHARMACIST	HOSPITAL	PHARMACIST	CLINICAL	OTHER
1																
2																
3																
4																
5	50.00%		100.0%													
6																
7																
8																
9	16.67%						50.00%									
10	22.22%	16.67%					18.18%									100.0
11	44.44%	100.0%					25.00%		50.00%							
12	12.50%		50.00%				12.50%									
13																
14																
15																
16																
17																

TABLE OF AVERAGE TIME SPENT IN MINUTES ANSWERING REQUESTS

REQUEST	TOTAL	PHYSICIAN	INTERN	RESIDENT	MEDICAL	STUDENT	NURSE	SPECIAL	NURSE	PHARMACIST	COMMUNITY	PHARMACIST	HOSPITAL	PHARMACIST	CLINICAL	OTHER
1	3.6	3.0					3.5		4.0							
2																
3	3.5	3.5					3.3									
4	6.0						4.0									10.0
5	7.5		10.0		5.0											
6	8.3	8.3														
7																
8	3.0		2.0													5.0
9	244.0	725.0	5.0				2.0									5.0
10	6.0	5.8					5.7									10.0
11	6.4	10.0					6.3		5.8							
12	4.0	3.9	7.5				2.8									8.0
13																
14																
15																
16																
17	3.0	5.0										1.0				

```
*GO

FRED RUMPLE - PROGRAM 1

DECK # :1    FILE # :6

HIT SPACE BAR WHEN THAT DECK IS READY


HOSPITAL FILE # 6

TOTAL NUMBER OF REQUESTS MADE =    38
TOTAL TIME SPENT ON REQUESTS =    18 HRS  44 MINS  10 SECS
AVERAGE TIME SPENT PER REQUEST =     0 HRS  29 MINS  35 SECS

PERCENTAGE DISTRIBUTION OF REQUESTS WITH TYPE OF USER
```

REQUEST	TOTAL	PHYSICIAN	INTERN	RESIDENT	MEDICAL	STUDENT	NURSE	SPECIAL	NURSE	PHARMACIST	COMMUNITY	PHARMACIST	HOSPITAL	PHARMACIST	CLINICAL	OTHER
1	2.63%						2.63%									
2	10.53%	2.63%	5.26%				2.63%									
3	2.63%	2.63%														
4																
5	2.63%		2.63%													
6	5.26%		5.26%													
7																
8	5.26%		2.63%													2.63
9																
10	13.16%	7.89%					5.26%									
11	21.05%		7.89%		5.26%		7.89%									
12	23.68%	2.63%	10.53%		2.63%		5.26%					2.63%				
13																
14	2.63%						2.63%									
15	2.63%						2.63%									
16	2.63%						2.63%									
17	5.26%						2.63%									2.63

HOSPITAL FILE # 6

TABLE INDICATING FREQUENCY THAT SUBSEQUENT QUESTIONS WERE ASKED

REQUEST	TOTAL	PHYSICIAN	INTERNE	RESIDENT	MEDICAL	STUDENT	NURSE	SPECIAL	NURSE	PHARMACIST	PHCOMMAUNITY	PHARMACIST	PHARMACOSAPITAL	PHARMACIST	PHARMACLINICAL	OTHER
1	100.0%						100.0%									
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12	11.11%						50.00%									
13																
14																
15	100.0%						100.0%									
16	100.0%						100.0%									
17	50.00%															100.0

TABLE OF AVERAGE TIME SPENT IN MINUTES ANSWERING REQUESTS

REQUEST	TOTAL	PHYSICIAN	INTERNE	RESIDENT	MEDICAL	STUDENT	NURSE	SPECIAL	NURSE	PHARMACIST	PHCOMMAUNITY	PHARMACIST	PHARMACOSAPITAL	PHARMACIST	PHARMACLINICAL	OTHER
1	5.0						5.0									
2	5.5	2.0		6.3			7.5									
3	5.0	5.0														
4																
5	10.0			10.0												
6	8.8			8.8												
7																
8	3.0			1.0												5.0
9																
10	194.5	322.3					2.8									
11	3.0			3.3		3.5	2.3									
12	3.8	3.0		3.8		3.0	4.0						5.0			
13																
14	2.0						2.0									
15	10.0						10.0									
16	5.0						5.0									
17	5.5						1.0									10.0

*GO

FRED RUMPLE - PROGRAM 1

DECK # :1 FILE # :7

HIT SPACE BAR WHEN THAT DECK IS READY

HOSPITAL FILE # 7

TOTAL NUMBER OF REQUESTS MADE = 31
TOTAL TIME SPENT ON REQUESTS = 4 HRS 49 MINS 30 SECS
AVERAGE TIME SPENT PER REQUEST = 0 HRS 8 MINS 42 SECS

PERCENTAGE DISTRIBUTION OF REQUESTS WITH TYPE OF USER

REQUEST	TOTAL	PHYSICIAN	INTERNE	RESIDENT	MEDICAL	STUDENT	NURSE	SPECIAL	NUCLEAR	PHARMACIST	COMMUNITY	PHARMACIST	HOSPITAL	PHARMACIST	CLINICAL	OTHER
1	12.90%						12.90%									
2																
3	6.45%	6.45%														
4																
5	3.23%						3.23%									
6	9.68%	6.45%					3.23%									
7																
8																
9	3.23%															3.23
10																
11	45.16%	3.23%					38.71%	3.23%								
12																
13																
14	3.23%						3.23%									
15																
16	3.23%						3.23%									
17	12.90%						12.90%									

HOSPITAL FILE # 7

TABLE INDICATING FREQUENCY THAT SUBSEQUENT QUESTIONS WERE ASKED

REQUEST	TOTAL	PHYSICIAN	INTERN	RESIDENT	MEDICAL	STUDENT	NURSE	SPECIAL	NURSE	PHARMACIST	COMMUNITY	PHARMACIST	HOSPITAL	PHARMACIST	CLINICAL	OTHER
1																
2																
3																
4																
5																
6																
7																
8																
9	100.0%															100.0
10																
11	28.57%						33.33%									
12																
13																
14																
15																
16																
17	25.00%						25.00%									

TABLE OF AVERAGE TIME SPENT IN MINUTES ANSWERING REQUESTS

REQUEST	TOTAL	PHYSICIAN	INTERN	RESIDENT	MEDICAL	STUDENT	NURSE	SPECIAL	NURSE	PHARMACIST	COMMUNITY	PHARMACIST	HOSPITAL	PHARMACIST	CLINICAL	OTHER
1	7.8						7.8									
2																
3	15.0	15.0														
4																
5	5.0						5.0									
6	6.8	10.0					0.5									
7																
8																
9	25.0															25.0
10																
11	7.9	10.0					8.2	3.0								
12																
13																
14	5.0						5.0									
15																
16	10.0						10.0									
17	8.0						8.0									

```
*GO

FRED RUMPLE - PROGRAM 1

DECK # :1    FILE # :8

HIT SPACE BAR WHEN THAT DECK IS READY
```

HOSPITAL FILE # 8

TOTAL NUMBER OF REQUESTS MADE = 178
TOTAL TIME SPENT ON REQUESTS = 13 HRS 55 MINS 50 SECS
AVERAGE TIME SPENT PER REQUEST = 0 HRS 4 MINS 42 SECS

PERCENTAGE DISTRIBUTION OF REQUESTS WITH TYPE OF USER

REQUEST	TOTAL	PHYSICIAN	INTERN	RESIDENT	MEDICAL STUDENT	NURSE	SPECIAL PURPOSE	PHARMACY	PHARMACOMMUNITY	PHARMACIST	PHARMACOMMUNITY	PHARMACIST	PHARMACOMMUNITY	PHARMACIST	OTHER
1	8.99%	2.25%	0.56%			6.18%									
2	0.56%					0.56%									
3	6.74%	4.49%	1.12%			1.12%									
4	0.56%	0.56%													
5	1.69%	0.56%				1.12%									
6	11.24%	5.62%	1.12%		0.56%	2.81%									1.12
7	0.56%														0.56
8	1.12%	0.56%	0.56%												
9	3.37%	1.12%	0.56%			1.69%									
10	7.30%	2.25%			0.56%	3.93%									0.56
11	24.72%	2.81%	2.25%			17.98%	1.12%				0.56%				
12	15.73%	8.43%	1.12%		0.56%	4.49%	0.56%								0.56
13															
14															
15	0.56%										0.56%				
16	1.69%	1.12%			0.56%										
17	15.17%	3.37%	2.25%			7.87%	0.56%				1.12%				

HOSPITAL FILE # 8

TABLE INDICATING FREQUENCY THAT SUBSEQUENT QUESTIONS WERE ASKED

REQUEST	TOTAL	PHYSICIAN	INTERNS	RESIDENT	MEDICAL	STUDENT	NURSE	SPECIAL	SPECIAL NURSE	PHARMACIST	PHARMACOMMUNICATIST	PHARMACOMMUNICATY	PHARMACIST	PHARMACOMMUNICATIST	PHARMACIST	PHARMACOMMUNICATIST	OTHER
1	12.50%	25.00%	100.0%														
2																	
3	25.00%	37.50%															
4																	
5	66.67%	100.0%					50.00%										
6	15.00%	20.00%	50.00%														
7																	
8																	
9																	
10	30.77%						57.14%										
11	2.27%						3.13%										
12	25.00%	46.67%															
13																	
14																	
15																	
16	33.33%	50.00%															
17	11.11%	16.67%	25.00%				7.14%										

TABLE OF AVERAGE TIME SPENT IN MINUTES ANSWERING REQUESTS

REQUEST	TOTAL	PHYSICIAN	INTERNS	RESIDENT	MEDICAL	STUDENT	NURSE	SPECIAL	SPECIAL NURSE	PHARMACIST	PHARMACOMMUNICATIST	PHARMACOMMUNICATY	PHARMACIST	PHARMACOMMUNICATIST	PHARMACIST	PHARMACOMMUNICATIST	OTHER
1	1.3	1.8		0.5			1.3										
2	1.0						1.0										
3	4.6	4.1		3.0			8.0										
4	2.0	2.0															
5	4.7	10.0					2.0										
6	4.3	1.4		1.5		60.0	0.3										4.4
7	3.0																3.0
8	2.5	2.0		3.0													
9	1.4	1.5		2.0			1.1										
10	3.0	6.4				1.0	0.8										7.0
11	2.2	1.0		2.5			2.2		4.0				3.0				
12	8.3	7.1		6.5		10.0	10.9		5.0								10.0
13																	
14																	
15	5.0												5.0				
16	6.0	6.5				5.0											
17	9.2	33.1		1.5			2.3		5.0				4.0				

Appendix VI

```
V A
C:FOCAL-11,LFOCA-A

1.01 E
1.10 T !!!"FRED RUMPLE - PROGRAM 2"!!
1.20 A "DECK # "D," NUMBER OF FILES "!
1.25 T !!"HIT SPACE BAR WHEN THAT DECK IS READY"!!;X FCHR(-1)
1.30 N DRD;N DWD;
1.35 F I=1,N;D 5
1.36 F J=1,9;S AA(0,J)=100*AA(0,J)/TJ
1.37 V E;N DRD;T !"TOTAL NUMBER OF QUESTIONS ASKED "%5,TJ," FOR"
1.38 T " ALL FILES"!!,"PERCENTAGE DISTRIBUTION OF REQUESTS WITH "
1.39 T "TYPE OF USER FOR ALL FILES"!
1.40 D 9;V N
1.45 F I=1,N;D 6
1.50 T !!"ALL"
1.55 F J=1,9;T %4.02,AA(0,J),"% "
1.66 V E;T !!!!;Q

5.10 N DRND;S NQ=F636(0)
5.20 F L=1,NQ;D 7
5.30 F J=1,9;D 8
5.35 S TJ=TJ+NQ
5.40 R

6.10 T !%2,I," ";S J=0
6.20 S J=J+1;I (J-10)6.3;R
6.30 I (AA(I,J))6.4,6.4;T %4.02,AA(I,J),"% ";G 6.2
6.40 T "        ";G 6.2

7.10 S CH=(L-1)*7;S YY=F636(CH+4)
7.20 S AA(I,YY)=AA(I,YY)+1
7.30 R

8.10 S AA(0,J)=AA(0,J)+AA(I,J)
8.20 I (AA(I,J))8.4,8.4
8.30 S AA(I,J)=100*AA(I,J)/TJ
8.40 R

9.10 T !"                                    P      P"
9.12 T "      P"!"     P                                "
9.13 T "H C    H      H"!"     H       R                "
9.14 T "          A O    A H    A C"!"     Y       E    N S"
9.15 T "           S      P M    P O    P L"!"     S     "
9.16 T "I S    D T           P      M N    M S    M I"!"    "
9.17 T " I     N I    D U     N     E N    A U    A F    A J     O"!
9.18 T "F    C     T D    I D     U     C U    C J    C I   "
9.19 T " C I     T"!"I    I     E E    C E     P     I E    "
9.20 T "I I    I T    I C     H"!"L    A     P N    A I    "
9.21 T "S     A S    S T    S A    S A     E"!"E    J     "
9.22 T "N T    L T     E     L E    T Y    T L    T L     R"!
9.30 R
```

GO

FRED RUMPLE - PROGRAM 2

DECK # :1 NUMBER OF FILES :8

HIT SPACE BAR WHEN THAT DECK IS READY

TOTAL NUMBER OF QUESTIONS ASKED = 1404 FOR ALL FILES

PERCENTAGE DISTRIBUTION OF REQUESTS WITH TYPE OF USER FOR ALL FILES

FILE	PHYSICIAN	INTERN	RESIDENT	MEDICAL STUDENT	NURSE	SPECIAL NURSE	PHARMACIST COMMUNITY	PHARMACIST HOSPITAL	PHARMACIST CLINICAL	OTHER
1	16.87%	12.85%	2.01%	41.37%	4.[illegible]%	1.61%	3.[illegible]%	[illegible]	17.67%	
2	17.69%	6.82%	2.72%	33.10%	6.1[illegible]%	2.04%	5.[illegible]%		21.[illegible]%	
3	1[illegible].09%	8.06%	0.39%	63.35%	1.[illegible]%	1.1[illegible]%	0.[illegible]%		1.77%	
4	15.29%	5.71%	1.14%	70.29%	0.57%	1.14%	0.57%		2.[illegible]%	
5	33.77%	7.79%	1.30%	41.56%	7.79%		1.3[illegible]%		6.4[illegible]%	
6	15.79%	34.21%	7.89%	34.21%			2.63%		5.[illegible]%	
7	16.13%			77.42%	3.23%				3.[illegible]%	
8	23.15%	9.55%	2.25%	47.75%	2.25%		2.[illegible]%		[illegible]	
ALL	[illegible]	9.1[illegible]%	1.50%	56.[illegible]%	0.71%	1.27%	1.[illegible]%	[illegible]	7.1[illegible]%	

Appendix VII

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 V A
C:FOCAL-11,LFOCA-A

 1.01 E
 1.10 T !!!!!!!"FRED RUMPLE - PROGRAM 3"!!
 1.15 A "DECK # "D
 1.20 T !!"HIT SPACE BAR WHEN THAT DECK IS READY"!!!
 1.25 X FCHP(-1);N DRD;N DWD
 1.30 F J=1,8;D 5
 1.40 F I=1,17;S AA(I,9)=100*AA(I,9)/TT(I,9)
 1.50 N DRD
 1.55 F J=1,8;S AA(0,9)=AA(0,9)+AA(0,J);S TT(0,9)=TT(0,9)+TT(0,J)
 1.60 T "% FREQUENCY THAT REFERENCES WERE USED IN ANSWERING "
 1.65 T "REQUESTS"!!
 1.70 D 9;D 8
 1.75 T !!"TOTAL    ";F J=1,9;T %4.02,100*AA(0,J)/TT(0,J),"% "
 1.80 V E;T !!!!!!!!!!;Q

 5.10 N DFND;S NO=F636(0);S TN=TN+JQ
 5.15 F L=1,NO;D 6
 5.16 F I=1,17;S AA(0,J)=AA(0,J)+AA(I,J);S TT(0,J)=TT(0,J)+TT(I,J)
 5.20 F I=1,17;S AA(I,J)=100*AA(I,J)/TT(I,J)
 5.25 P

 6.10 S CH=(L-1)*7;S XX=F636(CH+1)
 6.15 S TT(XX,J)=TT(XX,J)+1
 6.16 S TT(XX,9)=TT(XX,9)+1
 6.20 I (F636(CH+3)-6)6.3,6.9,6.3
 6.30 S AA(XX,J)=AA(XX,J)+1;S AA(XX,9)=AA(XX,9)+1
 6.90 P

 7.10 S J=0
 7.20 S J=J+1;I (J-10)7.3;P
 7.30 I (AA(I,J))7.5,7.5;T " "%4.02,AA(I,J),"%";G 7.2
 7.50 T "        ";G 7.2

 8.10 F I=1,17;T !"   "%2,I,"  ";D 7
 8.20 P

 9.10 T !"REQUEST"!" CODE  ";V J
 9.20 F I=1,17;T "FILE "%1,I," "
 9.30 T " TOTAL";P
```

GO

FRED RUMPLE - PROGRAM 3

DECK # :1

HIT SPACE BAR WHEN THAT DECK IS READY

% FREQUENCY THAT REFERENCES WERE USED IN ANSWERING REQUESTS

REQUEST CODE	FILE 1	FILE 2	FILE 3	FILE 4	FILE 5	FILE 6	FILE 7	FILE 8	TOTAL
1	33.33%	100.0%	72.73%	50.00%	80.00%		75.00%	62.50%	64.29%
2								100.0%	8.33%
3	30.77%	88.89%	69.57%	57.14%	80.00%	100.0%	100.0%	75.00%	67.69%
4	14.29%	71.43%	33.33%	66.67%	66.67%				36.96%
5	100.0%		100.0%	100.0%	100.0%	100.0%		100.0%	34.62%
6	25.00%	34.78%	21.95%	16.42%	66.67%	50.00%	66.67%	25.00%	23.31%
7	100.0%		100.0%					100.0%	50.00%
8	45.45%		16.67%	100.0%	100.0%	50.00%			44.00%
9	50.00%	75.00%	50.00%	33.33%	50.00%			33.33%	47.54%
10	65.00%	62.50%	70.59%		72.22%	100.0%		23.08%	62.00%
11	90.91%	90.91%	83.33%	81.82%	88.89%	100.0%	92.86%	81.82%	85.31%
12	47.62%	75.51%	31.58%	32.56%	75.00%	22.22%		35.71%	45.42%
13		100.0%	33.33%						40.00%
14			50.00%			100.0%			40.00%
15	50.00%	33.33%	100.0%			100.0%			55.56%
16		100.0%	100.0%				100.0%	100.0%	80.00%
17	40.00%	78.57%	29.41%	50.00%	50.00%		100.0%	40.74%	47.06%
TOTAL	40.55%	70.07%	41.26%	37.14%	75.38%	55.26%	30.65%	52.81%	44.[illegible]

```
)A
C:FOCAL-11,LFOCA-A

 1.01 E
 1.10 T !!!!"FRED PUMPLE - PROGRAM 4"!!;V N
 1.15 A "DECK # "D,"  HOW MAN" FILES TO BE USED "NN,!!
 1.20 F I=1,NN;A !"FILE #"NF(I)
 1.25 T !!"WIT SPACE BAR WHEN DECK IS READY"!
 1.30 X FCHR(-1)
 1.40 F L=1,NN;D 3
 1.45 N DPD
 1.50 F I=1,9;F J=1,4;D 6
 1.55 F J=1,4;D 7
 1.60 T !!!"% DISTRIBUTION OF REQUESTS WITH COMMUNICATION MODE"!
 1.70 D 10
 1.75 F I=1,9;S QQ=9+I/10;D QQ;F J=1,4;D 11
 1.80 T !!"TOTALS       "!F J=1,4;T AA(0,J),"%  "
 1.85 T !!!!"AVERAGE TIME IN MINUTES FOR VARIOUS COMMUNICATION"
 1.86 T "MODES"!;D 10
 1.88 F I=1,9;S QQ=9+I/10;D QQ;F J=1,4;D 12
 1.90 T !!"TOTALS       "!F J=1,4;T CC(0,J),"   "
 1.99 V E;T !!!!!!!!!;Q

 3.10 N DPD;N D"D;I (NF(L)-2)3.3
 3.20 F I=1,NF(L)-1;N DSD
 3.30 N DPND;S NQ=F636(0);S TN=TN+NQ
 3.40 F M=1,NQ;D 5
 3.50 P

 5.10 S CH=(M-1)*7;S XX=F636(CH+4);S YY=F636(CH+5)
 5.20 S AA(XX,YY)=AA(XX,YY)+1
 5.30 S BB(XX,YY)=BB(XX,YY)+F636(CH+7)/60
 5.40 S CC(0,YY)=CC(0,YY)+F636(CH+7)/60
 5.50 S AA(0,YY)=AA(0,YY)+1

 6.05 I (-AA(I,J))6.1;S BB(I,J)=0;P
 6.10 S BB(I,J)=BB(I,J)/AA(I,J)
 6.20 S AA(I,J)=100*AA(I,J)/TN;P

 7.10 I (-AA(0,J))7.2;S CC(0,J)=0;P
 7.20 S CC(0,J)=CC(0,J)/AA(0,J)
 7.30 S AA(0,J)=100*AA(0,J)/TN;P

 9.10 T !"PHYSICIAN    "!P
 9.20 T !"RESIDENT     "!P
 9.30 T !"MED.STUDENT "!P
 9.40 T !"NURSE        "!P
 9.50 T !"SPEC.NURSE   "!P
 9.60 T !"COM.PHARM    "!P
 9.70 T !"HOSP.PHARM   "!P
 9.80 T !"CLIN.PHARM   "!P
 9.90 T !"OTHER        "!P

10.10 T !"                PHONE   PERSONAL  LETTER   OTHER"!P

11.10 I (-AA(I,J))11.2;T "          "!P
11.20 T %5.02,AA(I,J),"%  "!P

12.10 I (-BB(I,J))12.2;T "          "!P
12.20 T %5.01,BB(I,J),"   "!P
```

*GO

FPED PUMPLE - PROGRAM 4

DECK # :1 HOW MANY FILES TO BE USED :1

FILE #:1

HIT SPACE BAR WHEN DECK IS READY

% DISTRIBUTION OF REQUESTS WITH COMMUNICATION MODE

	PHONE	PERSONAL	LETTER	OTHER
PHYSICIAN	11.65%	5.22%		
RESIDENT	12.45%	0.40%		
MED. STUDENT	1.61%	0.40%		
NURSE	35.34%	6.02%		
SPEC. NURSE	4.02%			
COM. PHARM	1.20%		0.40%	
HOSP. PHARM	3.21%			
CLIN. PHARM	0.40%			
OTHER	12.45%	5.22%		
TOTALS	82.33%	17.27%	0.40%	0.00%

AVERAGE TIME IN MINUTES FOR VARIOUS COMMUNICATION MODES

	PHONE	PERSONAL	LETTER	OTHER
PHYSICIAN	4.9	154.2		
RESIDENT	6.5	0.2		
MED. STUDENT	5.0	3.0		
NURSE	18.5	5.5		
SPEC. NURSE	8.1			
COM. PHARM	7.5		2.0	
HOSP. PHARM	5.7			
CLIN. PHARM	0.2			
OTHER	3.5	4.4		
TOTALS	11.0	50.0	2.0	0.0

90

FRED DIMPLE - PROGRAM 4

DECK # :1 HOW MANY FILES TO BE USED :8

FILE #:1
FILE #:2
FILE #:3
FILE #:4
FILE #:5
FILE #:6
FILE #:7
FILE #:8

HIT SPACE BAR WHEN DECK IS READY

% DISTRIBUTION OF REQUESTS WITH COMMUNICATION MODE

	PHONE	PERSONAL	LETTER	OTHER
PHYSICIAN	16.52%	3.49%		0.21%
RESIDENT	8.19%	1.00%		
MED.STUDENT	1.07%	0.36%	0.07%	
NURSE	52.35%	2.92%	0.21%	0.71%
SPEC.NURSE	2.35%	0.36%		
COM.PHARM	1.02%		0.07%	
HOSP.PHARM	1.57%	0.28%		
CLIN.PHARM	0.07%			
OTHER	5.77%	1.42%		
TOTALS	88.89%	9.83%	0.36%	0.93%

AVERAGE TIME IN MINUTES FOR VARIOUS COMMUNICATION MODES

	PHONE	PERSONAL	LETTER	OTHER
PHYSICIAN	15.8	49.9		4.0
RESIDENT	4.4	3.5		
MED.STUDENT	7.1	4.4	2.0	
NURSE	4.0	18.8	4.3	2.2
SPEC.NURSE	9.6	8.5		
COM.PHARM	24.5		2.0	
HOSP.PHARM	5.6	437.0		
CLIN.PHARM	0.0			
OTHER	72.0	5.7		
TOTALS	11.1	37.0	5.9	0.[illegible]

GO

FRED PUMPLE - PROGRAM 4

DECK # :1 HOW MANY FILES TO BE USED :1

FILE #:2

HIT SPACE BAR WHEN DECK IS READY

% DISTRIBUTION OF REQUESTS WITH COMMUNICATION MODE

	PHONE	PERSONAL	LETTER	OTHER
PHYSICIAN	9.52%	8.16%		
RESIDENT	2.72%	4.08%		
MED. STUDENT		2.04%	0.68%	
NURSE	30.61%	7.48%		
SPEC. NURSE	4.08%	2.04%		
COM. PHARM	2.04%			
HOSP. PHARM	4.08%	1.36%		
CLIN. PHARM				
OTHER	19.05%	2.04%		
TOTALS	72.11%	27.21%	0.68%	0.00%

AVERAGE TIME IN MINUTES FOR VARIOUS COMMUNICATION MODES

	PHONE	PERSONAL	LETTER	OTHER
PHYSICIAN	22.1	19.1		
RESIDENT	10.0	4.0		
MED. STUDENT		3.0	2.0	
NURSE	6.7	26.9		
SPEC. NURSE	10.0	10.0		
COM. PHARM	103.5			
HOSP. PHARM	10.1	990.0		
CLIN. PHARM				
OTHER	200.5	9.7		
TOTALS	63.7	64.9	2.0	0.0

GO

FRED PUMPLE - PROGRAM 4

DECK # :1 HOW MANY FILES TO BE USED :1

FILE #:3

HIT SPACE BAR WHEN DECK IS READY

% DISTRIBUTION OF REQUESTS WITH COMMUNICATION MODE

	PHONE	PERSONAL	LETTER	OTHER
PHYSICIAN	16.31%	0.98%		
RESIDENT	7.47%	0.59%		
MED. STUDENT	0.39%			
NURSE	67.19%	0.59%		1.57%
SPEC. NURSE	1.38%			
COM. PHARM	1.18%			
HOSP. PHARM	0.59%			
CLIN. PHARM				
OTHER	1.77%			
TOTALS	96.27%	2.16%	0.00%	1.57%

AVERAGE TIME IN MINUTES FOR VARIOUS COMMUNICATION MODES

	PHONE	PERSONAL	LETTER	OTHER
PHYSICIAN	2.0	7.4		
RESIDENT	2.3	6.5		
MED. STUDENT	2.0			
NURSE	0.9	2.8		2.1
SPEC. NURSE	11.0			
COM. PHARM	1.2			
HOSP. PHARM	1.0			
CLIN. PHARM				
OTHER	2.6			
TOTALS	1.4	5.9	0.0	2.1

GO

FRED RUMPLE - PROGRAM 4

DECK # :1 HOW MANY FILES TO BE USED :1

FILE #14

HIT SPACE BAR WHEN DECK IS READY

% DISTRIBUTION OF REQUESTS WITH COMMUNICATION MODE

	PHONE	PERSONAL	LETTER	OTHER
PHYSICIAN	16.57%	1.71%		
RESIDENT	5.14%	0.57%		
MED. STUDENT	1.14%			
NURSE	69.14%	1.14%		
SPEC. NURSE	0.57%			
COM. PHARM	1.14%			
HOSP. PHARM	0.57%			
CLIN. PHARM				
OTHER	2.29%			
TOTALS	96.57%	3.43%	0.00%	0.00%

AVERAGE TIME IN MINUTES FOR VARIOUS COMMUNICATION MODES

	PHONE	PERSONAL	LETTER	OTHER
PHYSICIAN	5.9	16.8		
RESIDENT	3.7	1.0		
MED. STUDENT	1.0			
NURSE	1.3	1.0		
SPEC. NURSE	1.0			
COM. PHARM	2.0			
HOSP. PHARM	0.5			
CLIN. PHARM				
OTHER	0.7			
TOTALS	2.2	5.9	0.0	0.0

GO

FPED RUMPLE - PROGRAM 4

DECK # :1 HOW MANY FILES TO BE USED :1

FILE #:5

HIT SPACE BAR WHEN DECK IS READY

% DISTRIBUTION OF REQUESTS WITH COMMUNICATION MODE

	PHONE	PERSONAL	LETTER	OTHER
PHYSICIAN	23.38%	9.09%		1.30%
RESIDENT	5.19%	2.60%		
MED. STUDENT	1.30%			
NURSE	33.77%	3.90%	3.90%	
SPEC. NURSE	6.49%	1.30%		
COM. PHARM				
HOSP. PHARM	1.30%			
CLIN. PHARM				
OTHER	3.90%	2.60%		
TOTALS	75.32%	19.48%	3.90%	1.30%

AVERAGE TIME IN MINUTES FOR VARIOUS COMMUNICATION MODES

	PHONE	PERSONAL	LETTER	OTHER
PHYSICIAN	84.4	6.7		5.0
RESIDENT	7.5	2.0		
MED. STUDENT	5.0			
NURSE	3.7	5.7	8.3	
SPEC. NURSE	5.2	5.0		
COM. PHARM				
HOSP. PHARM	1.0			
CLIN. PHARM				
OTHER	7.7	7.5		
TOTALS	29.3	5.9	8.3	5.0

GO

FRED PUMPLE - PROGRAM 4

DECK # :1 HOW MANY FILES TO BE USED :1

FILE #:6

HIT SPACE BAR WHEN DECK IS READY

% DISTRIBUTION OF REQUESTS WITH COMMUNICATION MODE

	PHONE	PERSONAL	LETTER	OTHER
PHYSICIAN	7.89%	2.63%		5.26%
RESIDENT	31.58%	2.63%		
MED. STUDENT	7.89%			
NURSE	28.95%			5.26%
SPEC. NURSE				
COM. PHARM				
HOSP. PHARM		2.63%		
CLIN. PHARM				
OTHER	2.63%	2.63%		
TOTALS	79.95%	10.53%	0.00%	10.53%

AVERAGE TIME IN MINUTES FOR VARIOUS COMMUNICATION MODES

	PHONE	PERSONAL	LETTER	OTHER
PHYSICIAN	321.7	5.0		3.5
RESIDENT	5.5	0.2		
MED. STUDENT	3.3			
NURSE	4.1			2.8
SPEC. NURSE				
COM. PHARM				
HOSP. PHARM		5.0		
CLIN. PHARM				
OTHER	10.0	5.0		
TOTALS	36.6	3.8	0.0	3.1

GO

FRED PUMPLE - PROGRAM 4

DECK # :1 HOW MANY FILES TO BE USED :4

FILE #:7

HIT SPACE BAR WHEN DECK IS READY

% DISTRIBUTION OF REQUESTS WITH COMMUNICATION MODE

	PHONE	PERSONAL	LETTER	OTHER
PHYSICIAN	16.13%			
RESIDENT				
MED. STUDENT				
NURSE	67.74%	9.68%		
SPEC. NURSE	3.23%			
COM. PHARM				
HOSP. PHARM				
CLIN. PHARM				
OTHER	3.23%			
TOTALS	90.32%	9.68%	0.00%	0.00%

AVERAGE TIME IN MINUTES FOR VARIOUS COMMUNICATION MODES

	PHONE	PERSONAL	LETTER	OTHER
PHYSICIAN	12.0			
RESIDENT				
MED. STUDENT				
NURSE	7.6	7.3		
SPEC. NURSE	3.0			
COM. PHARM				
HOSP. PHARM				
CLIN. PHARM				
OTHER	25.0			
TOTALS	8.8	7.3	0.0	0.0

GO

FRED PUMPLE - PROGRAM 4

DECK # :1 HOW MANY FILES TO BE USED :1

FILE #:8

HIT SPACE BAR WHEN DECK IS READY

% DISTRIBUTION OF REQUESTS WITH COMMUNICATION MODE

	PHONE	PERSONAL	LETTER	OTHER
PHYSICIAN	28.65%	4.49%		
RESIDENT	9.55%			
MED. STUDENT	1.69%	0.56%		
NURSE	45.51%	2.25%		
SPEC. NURSE	1.69%	0.56%		
COM. PHARM				
HOSP. PHARM	1.69%	0.56%		
CLIN. PHARM				
OTHER	2.25%	0.56%		
TOTALS	91.01%	8.99%	0.00%	0.00%

AVERAGE TIME IN MINUTES FOR VARIOUS COMMUNICATION MODES

	PHONE	PERSONAL	LETTER	OTHER
PHYSICIAN	6.8	9.2		
RESIDENT	2.6			
MED. STUDENT	22.0	10.0		
NURSE	2.7	3.9		
SPEC. NURSE	4.3	5.0		
COM. PHARM				
HOSP. PHARM	4.3	3.0		
CLIN. PHARM				
OTHER	4.7	10.0		
TOTALS	4.4	7.3	0.0	0.0

*

GO

FRED PUMPLE - PROGRAM 4

DECK # :1 HOW MANY FILES TO BE USED :3

FILE #:1
FILE #:3
FILE #:5

HIT SPACE BAR WHEN DECK IS READY

% DISTRIBUTION OF REQUESTS WITH COMMUNICATION MODE

	PHONE	PERSONAL	LETTER	OTHER
PHYSICIAN	15.57%	2.99%		0.12%
RESIDENT	8.74%	0.72%		
MED. STUDENT	0.84%	0.12%		
NURSE	54.61%	2.51%	0.36%	0.96%
SPEC.NURSE	2.63%	0.12%		
COM. PHARM	1.08%		0.12%	
HOSP. PHARM	1.44%			
CLIN. PHARM	0.12%			
OTHER	5.15%	1.80%		
TOTALS	90.18%	8.26%	0.48%	1.08%

AVERAGE TIME IN MINUTES FOR VARIOUS COMMUNICATION MODES

	PHONE	PERSONAL	LETTER	OTHER
PHYSICIAN	14.0	83.5		5.0
RESIDENT	4.4	3.9		
MED. STUDENT	4.1	3.0		
NURSE	4.5	5.2	8.3	2.1
SPEC.NURSE	8.4	5.0		
COM. PHARM	3.3		2.0	
HOSP. PHARM	4.1			
CLIN. PHARM	0.2			
OTHER	3.8	4.8		
TOTALS	6.2	33.4	6.8	2.4

GO

FPED RUMPLE - PROGRAM 4

DECK # :1 HOW MANY FILES TO BE USED :3

FILE #:2
FILE #:4
FILE #:6

HIT SPACE BAR WHEN DECK IS READY

% DISTRIBUTION OF REQUESTS WITH COMMUNICATION MODE

	PHONE	PERSONAL	LETTER	OTHER
PHYSICIAN	12.78%	4.44%		0.56%
RESIDENT	6.94%	2.22%		
MED. STUDENT	1.39%	0.83%	0.28%	
NURSE	49.17%	3.61%		0.56%
SPEC. NURSE	1.94%	0.83%		
COM. PHARM	1.39%			
HOSP. PHARM	1.94%	0.83%		
CLIN. PHARM				
OTHER	9.17%	1.11%		
TOTALS	84.72%	13.89%	0.28%	1.11%

AVERAGE TIME IN MINUTES FOR VARIOUS COMMUNICATION MODES

	PHONE	PERSONAL	LETTER	OTHER
PHYSICIAN	31.4	17.8		3.5
RESIDENT	5.6	3.1		
MED. STUDENT	2.4	3.0	2.0	
NURSE	2.8	22.9		2.8
SPEC. NURSE	16.4	10.8		
COM. PHARM	62.9			
HOSP. PHARM	8.7	661.7		
CLIN. PHARM				
OTHER	170.5	7.8		
TOTALS	26.9	53.3	2.0	3.1

```
C:FOCAL-11,LFOCA-A

 1.01 E
 1.02 V E;U E
 1.05 T !!"FRED RUMPLE - PROGRAM 1. MODIFIED TO COMBINE FILES"
 1.06 A !!"DECK # "D," NUMBER OF FILES "NN
 1.10 T !!"LIST FILES IN ASCENDING ORDER "
 1.14 F I=1,NN;A !"FILE "GN(I)," REQUIRED"
 1.15 T !!"HIT SPACE BAR WHEN SYSTEM IS READY";X FCHR(-1)
 1.16 N DRD;N DWD
 1.18 S PQ=1
 1.20 S PN=PN+1
 1.30 I (GN(PN)-PQ)1.35,1.4,1.35
 1.35 N DSD;N DWD;S PQ=PQ+1;G 1.3
 1.40 N DRD;N DWD;S PQ=PQ+1;S PZ=PZ+1;
 1.50 D 13;S PT=PT+TR;I (PZ-NN)1.2;N DRD;S TR=PT

 2.10 F I=1,17;F J=0,9;D 6

 3.10 T !!!
 3.15 T !!"TOTAL NUMBER OF REQUESTS MADE "%4,TR
 3.17 T !"TOTAL TIME SPENT ON REQUESTS ";S ZZ=TT;D 8
 3.19 T !"AVERAGE TIME SPENT PER REQUEST ";S ZZ=TT/TR;D 8
 3.20 T !!"PERCENTAGE DISTRIBUTION OF REQUESTS WITH TYPE OF USER"!
 3.22 D 9;V N
 3.25 F I=1,17;D 10
 3.50 T !!!;D 3.1;
 3.52 T !!"TABLE INDICATING FREQUENCY THAT SUBSEQUENT QUESTIONS"
 3.53 T " WERE ASKED"!
 3.55 D 9;V N
 3.57 F I=1,17;D 11
 3.60 T !"TABLE OF AVERAGE TIME SPENT IN MINUTES ANSWERING"
 3.62 T " REQUESTS"!;D 9
 3.64 F I=1,17;D 12
 3.66 V E;T !!!!!!!!!!!;Q

 5.10 S CH=(I-1)*7;S XX=F636(CH+1);S YY=F636(CH+4)
 5.15 S AA(XX,YY)=AA(XX,YY)+1
 5.20 I (-F636(CH+2))5.3,5.4
 5.30 S BB(XX,YY)=BB(XX,YY)+1;S BB(XX,0)=BB(XX,0)+1
 5.40 S CC(XX,YY)=CC(XX,YY)+F636(CH+7)/60
 5.50 S TT=TT+F636(CH+7)
 5.60 S AA(XX,0)=AA(XX,0)+1
 5.65 S CC(XX,0)=CC(XX,0)+F636(CH+7)/60
 5.70 R

 6.05 I (AA(I,J))6.1,6.3
 6.10 S CC(I,J)=CC(I,J)/AA(I,J)
 6.20 S BB(I,J)=100*BB(I,J)/AA(I,J)
 6.30 S AA(I,J)=100*AA(I,J)/TR
 6.40 R
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```
8.10 S TH=FITR(ZZ/3600);S TM=FITR((ZZ-3600*TH)/60)
8.20 S TS=ZZ-TH*3600-TM*60
8.30 T %4,TH," HRS  ";V N;T %2,TM," MINS  ",TS," SECS";V E
8.40 R

9.10 T !"                                                  P      P"
9.12 T "      P"!"              P                                  "
9.13 T "H C    H      H"!"              H      R                  "
9.14 T "          A O    A H    A C"!"R          Y       E    H S"
9.15 T "           S      R M    R O    R L"!"E          S      "
9.16 T "I S    E T            P      M M    M S    M I"!"O    T     "
9.17 T " I     N I    D U     N      E N    A U    A P    A N     O"!
9.18 T "U    O      C     T D    I D     U     C U    C N    C I   "
9.19 T " C I     T"!"E    T      I     E E    C E     R     I R    "
9.20 T "I I    I T    I C     H"!"S    A      A     H N    A N     "
9.21 T "S     A S    S T    S A    S A     E"!"T    L      N .  "
9.22 T "N T    L T     E     L E    T Y    T L    T L     R"!!
9.30 R

10.10 T %2,I," ";S J=-1
10.20 S J=J+1;I (AA(I,J))10.3,10.3,10.4
10.30 I (8-J)10.35;T "        ";G 10.2
10.35 T !;R
10.40 T %4.02,AA(I,J);I (8-J)10.45;T "% ";G 10.2
10.45 R

11.10 T %2,I," ";S J=-1
11.20 S J=J+1;I (BB(I,J))11.3,11.3,11.4
11.30 I (8-J)11.35;T "        ";G 11.2
11.35 T !;R
11.40 T %4.02,BB(I,J);I (8-J)11.45;T "% ";G 11.2
11.45 R

12.10 T %2,I," ";S J=-1
12.20 S J=J+1;I (CC(I,J))12.3,12.3,12.4
12.30 I (8-J)12.35;T "        ";G 12.2
12.35 T !;R
12.40 I (8-J)12.45;T %5.01,CC(I,J)," ";G 12.2
12.45 T %4.01,CC(I,J);R

13.10 S TP=F636(0)
13.20 F I=1,TP;D 5
13.30 R
```

```
*C      RESULTS IN RAW NUMBER FORM
*" A
C:FOCAL-11,LFOCA-A

  1.01 E
  1.02 V E;U E
  1.05 T !!"FRED RUMPLE - PROGRAM 1. MODIFIED TO COMBINE FILES"
  1.06 A !!"DECK # "D," NUMBER OF FILES "NN
  1.10 T !!"LIST FILES IN ASCENDING ORDER "
  1.14 F I=1,NN;A !"FILE "GN(I)," REQUIRED"
  1.15 T !!"HIT SPACE BAR WHEN SYSTEM IS READY";X FCHR(-1)
  1.16 N DRD;N DWD
  1.18 S PO=1
  1.20 S PN=PN+1
  1.30 I (GN(PN)-PO)1.35,1.4,1.35
  1.35 N DSD;N DWD;S PO=PO+1;G 1.3
  1.40 N DFND;N DWD;S PO=PO+1;S PZ=PZ+1;
  1.50 D 13;S PT=PT+TR;I (PZ-NN)1.2;N DRD;S TR=PT

  3.10 T !!!
  3.15 T !!"TOTAL NUMBER OF REQUESTS MADE "%4,TR
  3.17 T !"TOTAL TIME SPENT ON REQUESTS ";S ZZ=TT;D 8
  3.19 T !"AVERAGE TIME SPENT PER REQUEST ";S ZZ=TT/TR;D 8
  3.20 T !!"DISTRIBUTION OF REQUESTS WITH TYPE OF USER"!
  3.22 D 9;V N
  3.25 F I=1,17;D 10
  3.50 T !!!;D 3.1;
  3.52 T !!"TABLE INDICATING FREQUENCY THAT SUBSEQUENT QUESTIONS"
  3.53 T " WERE ASKED"!
  3.55 D 9;V N
  3.57 F I=1,17;D 11
  3.60 T !"TABLE OF TIME SPENT IN MINUTES ANSWERING"
  3.62 T " REQUESTS"!;D 9
  3.64 F I=1,17;D 12
  3.66 V E;T !!!!!!!!!!!;Q

  5.10 S CH=(I-1)*7;S XX=F636(CH+1);S YY=F636(CH+4)
  5.15 S AA(XX,YY)=AA(XX,YY)+1
  5.20 I (-F636(CH+2))5.3,5.4
  5.30 S BB(XX,YY)=BB(XX,YY)+1;S BB(XX,0)=BB(XX,0)+1
  5.40 S CC(XX,YY)=CC(XX,YY)+F636(CH+7)/60
  5.50 S TT=TT+F636(CH+7)
  5.60 S AA(XX,0)=AA(XX,0)+1
  5.65 S CC(XX,0)=CC(XX,0)+F636(CH+7)/60
  5.70 P

  8.10 S TH=FITR(ZZ/3600);S TM=FITR((ZZ-3600*TH)/60)
  8.20 S TS=ZZ-TH*3600-TM*60
  8.30 T %4,TH," HRS  ";V N;T %2,TM," MINS  ",TS," SECS";V E
  8.40 P
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```
9.10 T !"                                                  P      P"
9.12 T "      P"!"              P                                  "
9.13 T "H C    H      H"!"              H       R                  "
9.14 T "          A O    A H    A C"!"R            Y       E    M S"
9.15 T "           S      R M    R O    R L"!"E            S     "
9.16 T "I S    E T            P      M M    M S    M I"!"Q    T     "
9.17 T " I     N I    D U     N      E N    A U    A P    A N     O"!
9.18 T "U    O      C     T D    I D     U     C U    C N    C I   "
9.19 T " C I     T"!"E    T      I     E E    C E     R     I R    "
9.20 T "I I    I T    I C     H"!"S     A      A     R N    A N    "
9.21 T "S     A S    S T    S A    S A     E"!"T    L      N     "
9.22 T "N T    L T     E     L E    T Y    T L    T L     R"!!
9.30 R

10.10 T %2,I," ";S J=-1
10.20 S J=J+1;I (AA(I,J))10.3,10.3,10.4
10.30 I (8-J)10.35;T "        ";G 10.2
10.35 T !;R
10.40 T %4.01,AA(I,J);I (8-J)10.45;T "  ";G 10.2
10.45 R

11.10 T %2,I," ";S J=-1
11.20 S J=J+1;I (BB(I,J))11.3,11.3,11.4
11.30 I (8-J)11.35;T "        ";G 11.2
11.35 T !;R
11.40 T %4.01,BB(I,J);I (8-J)11.45;T "  ";G 11.2
11.45 R

12.10 T %2,I," ";S J=-1
12.20 S J=J+1;I (CC(I,J))12.3,12.3,12.4
12.30 I (8-J)12.35;T "        ";G 12.2
12.35 T !;R
12.40 I (8-J)12.45;T %5.01,CC(I,J)," ";G 12.2
12.45 T %5,CC(I,J);R

13.10 S TR=F636(0)
13.20 F I=1,TR;D 5
13.30 R
```